

**IN THE UNITED STATES DISTRICT COURT  
FOR THE WESTERN DISTRICT OF PENNSYLVANIA**

HAYNES INTERNATIONAL, INC.,	)	
a Delaware corporation,	)	
	)	
Plaintiff,	)	Civil Action No. 04-197(E)
	)	
v.	)	JURY TRIAL DEMANDED
	)	
ELECTRALLOY, a Division of G.O.	)	
CARLSON, INC.,	)	Judge Cohill
a Pennsylvania corporation,	)	
	)	
Defendant.	)	

**SECOND DECLARATION OF PAUL MANNING**

1. I am Director of Marketing for Haynes International, Inc. ("Haynes"), and have held that position for the past four years. I am the same Paul Manning who submitted a declaration dated September 26, 2005.

2. Haynes has advertised and marketed 36 alloys during the past six years. Most of Haynes' marketing efforts involve more than one alloy. The average of Haynes' annual advertising and marketing expenses during the past six years is \$1,440,000.00. Most of those efforts involved C-22 alloy. If you divide Haynes total marketing and advertising expenses by the 36 alloys Haynes makes (even though C-22 alloy is and has been for the past six years in the top 10 in sales of all Haynes' 36 alloys) it comes out to \$40,000.00 per year in advertising and marketing expenses for C-22 alloy.

3. Whenever Haynes discovers a third party misusing C-22 or another of its trademarks or using C-22 and another Haynes trademark on products not made by Haynes, the company notifies the third party of the infraction and demands correction. When I learned of



uses of C-22 or C22 by others identified by counsel for Electralloy, I instructed our counsel to contact those parties and demand that the misuse of the trademark be stopped or corrected. Attached is a list of companies and their responses along with the correspondence which is identified on that list. The list also identifies those companies who are Haynes' customers and have purchased the C-22 alloy from Haynes. All but one of the notified companies that does business in the United States have corrected their mistakes. They either withdrew or corrected their web pages, brochures, or other materials in which C-22 was improperly used. Those who have continued to use C-22 are Haynes customers who buy C-22 alloy from Haynes. All have added a notice to their publications which says C-22 is a registered trademark of Haynes International. We are in the process of instituting legal action against the one company that said they will continue to use C22. One foreign company has yet to respond.

4. Also attached is a product sheet from Arcos Industries. Arcos sells welding rod within UNS No. N06022. Arcos has purchased the alloy used for these welding rods from manufacturers other than Haynes. Arcos does not use C-22 or any Haynes trademark to identify this alloy composition. Arcos uses the designation Alloy 22. Indeed, it is common practice for resellers of alloy products within UNS No. N06022 who purchase the alloy from several manufacturers to use Alloy 22 or UNS No. N06022 to identify products the sell which have this alloy composition.

I declare that the foregoing is true and correct, that all statements made on information and belief are believed to be true; and further that these statements were made with the

knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Date: October 10, 2005

Paul T. Manning  
Paul Manning

Haynes International, Inc. v. ElectrallyoyCompanies Misusing C-22

<u>Company/Contact</u>	<u>Date of Letter</u>	<u>Date of Response</u>	<u>Haynes Customer</u>	<u>Produced</u>
Allegheny Technologies Inc.	9/9/05	9/20/05		HE 00687-696
Patrick J. Viccaro, Esq.		Website corrected		
Bartalini Comm. Agt	9/13/05		possible customer	HE 00697-703
Francesco Bartalini				
Cbol Corporation	9/12/05	9/13/05		HE 00704-716
S. Don Kim, President/CEO		Website corrected		
Corrosion Materials	4/25/05 9/9/05	4/28/05 9/12/05	yes	HE 00717-740
Ron Campbell		Corrected		
Fast Alloys		Website corrected		HE 00741-743

<u>Company/Contact</u>	<u>Date of Letter</u>	<u>Date of Response</u>	<u>Haynes Customer</u>	<u>Produced</u>
Fisher-Rosemount Systems, Inc. Tom Snead, President	9/13/05	9/28/05  All distribution of paper has ceased.	yes	HE 00744-765
High Performance Alloys, Inc. Russell W. Kirchner, President	9/12/05	9/28/05  Initiating corrections	yes	HE 00766-776
Instrument Associates, Inc. Jay P. Fregneau, CEO	9/12/05	9/29/05  Website corrected		HE 00777-784
J.M. Canty, Inc. Thomas Canty, President	9/12/05	9/19/05  Will continue to use industry accepted name "C22"	yes	HE 00785-794
Maphil, International	9/9/05	9/13/05  Initiating corrections		HE 00795-796

<u>Company/Contact</u>	<u>Date of Letter</u>	<u>Date of Response</u>	<u>Haynes Customer</u>	<u>Produced</u>
National Specialty Alloys, Inc. Lane Cobden, President	9/13/05	9/14/05 Website corrected		HE 00797-805
Newman Flange & Fitting Co. Steve Bisset, President	9/12/05	Website corrected	yes	HE 00806-810
Oxford Alloys, Inc. Mark Ashworth, CEO	9/12/05	9/29/05 Initiating corrections to website	yes	HE 00811-816
Penn Machine Works, Inc. Ronald Lafferty, President	9/12/05	9/21/05 Website corrected	yes	HE 00817-834
TW Metals, Inc. Jack Elrod, President/CEO	9/12/05	9/26/05 Website corrected Brochures will be corrected no later than 1/1/06	yes	HE 00835-853

## Buchanan Ingersoll PC

ATTORNEYS

Lynn J. Alstadt  
412 562 1632  
alstadtlj@bipc.com

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[www.buchananingersoll.com](http://www.buchananingersoll.com)

September 9, 2005

Patrick J. Viccaro, Esq.  
Allegheny Technologies Incorporated  
1000 Six PPG Place  
Pittsburgh, Pennsylvania 15222-5479

Dear Pat:

This is further to our telephone conversation concerning the C-22 trademark of Haynes International. Enclosed is a copy web pages of ATI/Allvac Allegheny Technologies in which Nickelvac C 22 appears. During our telephone discussion you agreed that ATI Allvac should not be using C 22 on its website because C-22 is a registered trademark of Haynes International. You assured me that these web pages would be changed to eliminate the use of C 22.

I appreciate your cooperation and prompt attention to this matter.

Very truly yours,



Lynn J. Alstadt

LJA/bem

Enclosures

cc: Paul Manning (w/encl.)

HE 00687

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## Nickel-Base

Nickelvac® 400  
 Nickelvac K-500  
 Nickelvac H-X  
**Nickelvac C 22**  
 Allvac Alcorr®  
 Nickelvac 600  
 Nickelvac 601  
 Nickelvac 625  
 Nickelvac 690  
 Allvac Waspaloy®  
 Allvac Rene 41®  
 Nickelvac 80 A  
 Nickelvac N-90  
 Allvac M-252  
 Nickelvac C-263  
 Allvac 718  
 Allvac 718-OP ®  
 Nickelvac W-722  
 Nickelvac X-750  
 Nickelvac X-751  
 Allvac 330  
 Nickelvac 800 & 800 H  
 Nickelvac 825  
 Allvac 706  
 Nickelvac 901  
 Nickelvac H-N  
 Nickelvac H-W  
 Nickelvac C-276  
 Nickelvac HB-2  
 Allvac Astroloy™  
 Allvac 520  
 Allvac 720  
 Allvac 35N  
 Nickelvac L-605  
 Allvac TJA-1537™

## Nickelvac® C 22 (UNS-N06022)

### Composition

Compound	C	Co	Cr	Fe	Mn	Mo	Ni	P	Si	V	W
nominal wt. %	0.07	1.2	21.2	4.0	0.2	13.5	rem	0.01	0.04	0.17	3.0

### Mechanical Properties

Density lb/in <sup>3</sup> (g/cm <sup>3</sup> )	0.290 (8.02)
Metallurgical Condition	2,050 °F anneal
Tensile Strength, ksi (MPa)	115 (793)
0.2% Yield Strength, ksi (MPa)	50 (345)
Elongation, %	60
Reduction in Area, %	70
Typical Hardness	85 HRB

Typical room temperature mechanical properties.

The information, data, and specifications presented here are representative only, and are not guaranteed values. Material or product applications described herein are solely for illustrative purposes and should not be construed as express or limited warranties for fitness for these or other applications.

Data are typical and should not be construed as maximum or minimum values for specification or for final design. Data on any particular piece of material may vary from those shown herein.

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HE 00688



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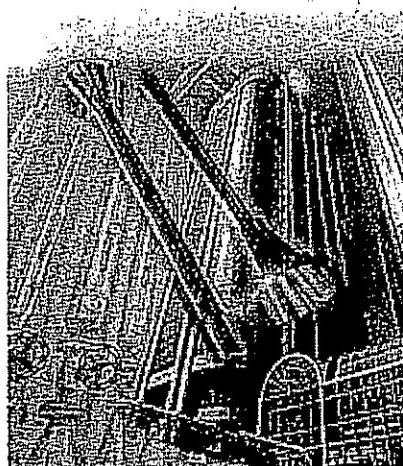
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*Specialty Materials That Make  
Our World™*

## Nickel-Base Superalloys

### Products

- Nickel-Base Superalloys
- Titanium and Titanium-Base Alloys
- Specialty Steel



Allvac Designation	Applications	Specifications
Nickelvac® 400 UNS-N04400	Nickel-Copper solid solution alloy. Equipment for mineral acids, brines, alkalis, offshore engineering, marine applications.	AMS 4675, 4730. ASTM B 127, B 164, B 564.
Nickelvac K-500 UNS-N05500	Pump and drive shafts, impellers, valve components, springs, fasteners, oil well packers, subsurface safety valves.	AMS 4676. ASTM F 467, F 468.
Nickelvac H-X UNS-N06002	Engines, furnaces, combustion chamber liners, nozzles, vanes, rings, turbine exhaust weldments, structural parts.	AMS 5754. ASTM B 435, B 572.
Nickelvac C 22 UNS-N06022	Pressure vessels, pumps, valves, HX tubing and piping for the CPI and HPI. Trays, flanges, fasteners, wire, screens.	ASTM B 564, B 574, B 575, B 619, B 622, B 626.
Allvac Allicorr® UNS-N06110	Equipment for deep sour gas wells, flue gas desulfurization, chemical and hydrocarbon processing, and pulp & paper.	ASTM B 564, B 755, B 756, B 757, B 758, B 759.
Nickelvac 600 UNS-N06600	Turbines, engines, nuclear reactor applications, chemical process equipment, high temperature fixtures.	AMS 5665. MIL-N-23229; ASTM B 166, B 167.
Nickelvac 601 UNS-N06601	Weld wire, woven wire mesh belts, rod for heat treat baskets, heat treat fixtures.	AMS 5715, 5870. ASTM B 166, B 167, B 168.
Nickelvac 625 UNS-N06625	Engines, nozzles, combustion and FGD systems, afterburner and spray bars, CPI & nuclear pumps, heat exchangers,	AMS 5666. EB 2949; ASTM B 444, B 446.

HE 00689

	tubing.	
Nickelvac 690 UNS-N06690	Commercial and naval nuclear applications, steam generator tubing.	ASTM B 163, B 166, B 167, B 168.
Allvac Waspaloy® UNS-N07001	Turbine compressor blades and discs, shafts, spacers, fasteners, miscellaneous jet engine hardware	AMS 5704, 5706, 5707, 5708, ASTM B 637.
Allvac Rene 41® UNS-N07041	Jet and rocket engines, torque rings, afterburners, hardware.	AMS 5712, 5713.
Nickelvac 80 A UNS-N07080	Components for gas turbine engines, exhaust valve stock for internal combustion engines, high temperature bolts & fasteners.	ASTM B 637.
Nickelvac N-90 UNS-N07090	Turbine blades and other jet engine components. Valves for internal combustion engines.	AMS 5829, SAE J 775.
Allvac M-252 UNS-N07252	Turbine blades, fasteners, and high temperature bolting.	AMS 5756, 5757, ASTM B 637.
Nickelvac C-263 UNS-N07263	Ring components in jet engines.	AMS 5886, 5966.
Allvac 718 UNS-N07718	Jet engines, turbines, fasteners, nuclear reactors.	AMS 5662, 5663, 5664, MIL-N-24469, RDT M2-18T, ASTM B 637.
Allvac 718-OP ® UNS-N07718	Turbines and engines, fasteners, sub-surface safety valves, hot extrusion tooling, nuclear reactors.	AMS 5662, 5663, 5664, MIL-N-24469, RDT M2-18T, ASTM B 637.
Allvac® 718Plus™	Jet Engine, Power Turbine, Space, and Tooling	Allvac 718Plus Billet & Bar Specification, AMS

UNS-N07818	markets	F.4.7 (Work Item Initiated Apr05).
Nickelvac W-722  UNS-N07722	Ring components in jet engines.	AMS 5714.
Nickelvac X-750  UNS-N07750	Turbine, engine components. Blades, vanes, fasteners, springs, bellows. Extrusion dies, nuclear, heat treating, forming tools.	AMS 5667, 5668, 5669, 5670, 5671. MIL-N-24114, ASTM B 637.
Allvac X-751®  UNS-N07751	Components for gas turbine engines, exhaust valve stock for internal combustion engines.	SAE J775 (HEV-3).
Allvac 330  UNS-N08330	Weld wire, woven wire mesh belts, rod for heat treat baskets, heat treat fixtures.	AMS 5592, 5716. ASTM B 511, B 512, B 535, B 536, B 739.
Nickelvac 800 & 800 H  UNS-N08800 & N08810	Corrosion-resistant alloy for petrochemical and food processing equipment, tubing, heat exchangers, and furnaces.	AMS 5766, 5871; ASTM B 163, B 407, B 408, B 409 B 515, B 564.
Nickelvac 825  UNS-N08825	Downhole tubulars for deep, corrosive wells. Pollution control , scrubber, and radwaste systems. CPI process piping systems.	ASTM B 163, B 423, B 424, B 425, B 704.
Allvac 706  UNS-N09706	Land based turbine wheels and spacers. Jet engine components.	AMS 5605, 5606, 5701, 5702, 5703.
Nickelvac 901  UNS-N09901	Turbine discs and shafts, compressor blades and discs, high temperature bolting, high-temperature devices, cryogenics.	AMS 5660, 5661.
Nickelvac 925  UNS-N09925	Oil and gas well applications, fasteners, CPI pressure vessel and piping systems, marine components.	NACE MR0175.
Nickelvac H-N	Turbine gas sealing	AMS 5771. ASTM B

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UNS-N10003	components	434, B 573.
Nickelvac H-W UNS-N10004	Aerospace rings, forgings, weld wire.	AMS 5755. ASME SFA5.14 (ERNiMo-3), AWS A5.14 (ERNiMo-3).
Nickelvac C-276 UNS-N10276	Pressure vessels, pumps, valves, HX tubing and piping for the CPI and HPI. Trays, flanges, fasteners, wire, screens.	ASTM B 574, B 622.
Nickelvac HB-2 UNS-N10665	Vessels, pumps, valves, piping systems for the production of hydrochloric, sulfuric, acetic, and phosphoric acids.	ASTM B 333, 335, 622.
Allvac Astroloy™ UNS-N13017	Discs, rings, bolts for gas turbines.	AMS 5851, 5852, 5882.
Allvac 520	Land based gas turbine blades.	GGC-0005, -1005.
Allvac 720	Wheels, jet engine turbine disks and blades.	MASS7252, MSRR 7252. EMS 73105.
Allvac 35N UNS-R30035	Aircraft fasteners. Line wire for down-hole instrumentation. Biomedical devices, high fatigue strength applications.	AMS 5758. ASTM F 562, ISO 5832-6.
Nickelvac L-605 UNS-R30605	Cobalt-base alloy for high-strength, high fatigue applications. Fasteners, jet engine components, medical and surgical devices.	AMS 5759. ASTM F 90, ISO 5832-5.
Allvac TJA-1537™ UNS-R31537 & R31538	Cobalt-base alloy for machined and forged medical and surgical devices requiring high fatigue strength; total joint replacement.	ASTM F 1537; ISO 5832-12.

HE 00692

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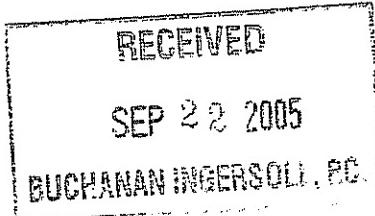
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e-mail: [pviccaro@alleghenytechnologies.com](mailto:pviccaro@alleghenytechnologies.com)

Patrick J. Viccaro  
Assistant General Counsel -  
Intellectual Property and Technology

September 20, 2005



Lynn J. Alstadt, Esquire  
Buchanan Ingersoll PC  
One Oxford Centre  
301 Grant Street, 20<sup>th</sup> Floor  
Pittsburgh, PA 15219-1410

Re: Haynes C-22 Trademark

Dear Lynn:

Thank you for your letter of September 9, 2005. The policy of Allegheny Technologies and its operating companies, such as ATI Allvac, is to respect the intellectual property rights of others, as we expect others to respect our rights.

This is to confirm that ATI Allvac's website no longer refers to the "C-22" trademark. ATI Allvac's use on its web pages was inadvertent and unintentional. The web pages have been changed.

Enclosed are copies of the current web pages for your convenience.

Regards,

Patrick J. Viccaro

PJV/ele

Enclosures

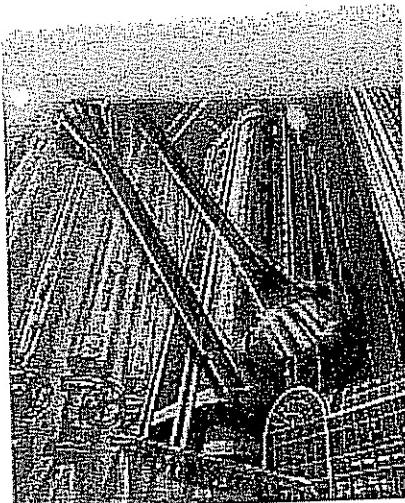
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Specialty Materials That Make  
Our World™

## Products

- Nickel-Base Superalloys
- Titanium and Titanium-Base Alloys
- Specialty Steel



## Nickel-Base Superalloys

Allvac Designation	Applications	Specifications
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Nickelvac K-500 UNS-N05500	Pump and drive shafts, impellers, valve components, springs, fasteners, oil well packers, subsurface safety valves.	AMS 4676 ASTM F 467, F 468.
Nickelvac H-X UNS-N06002	Engines, furnaces, combustion chamber liners, nozzles, vanes, rings, turbine exhaust weldments, structural parts.	AMS 5754. ASTM B 435, B 572.
Nickelvac 22 UNS-N06022	Pressure vessels, pumps, valves, HX tubing and piping for the CPI and HPI. Trays, flanges, fasteners, wire, screens.	ASTM B 564, B 574, B 575, B 619, B 622, B 626.
Allvac Alkonifi UNS-N06110	Equipment for deep sour gas wells, flue gas desulfurization, chemical and hydrocarbon processing, and pulp & paper.	ASTM B 564, B 755, B 756, B 757, B 758, B 759.
Nickelvac 600 UNS-N06600	Turbines, engines, nuclear reactor applications, chemical process equipment, high temperature fixtures.	AMS 5665. MIL-N-23229; ASTM B 166, B 167.
Nickelvac 601 UNS-N06601	Weld wire, woven wire mesh belts, rod for heat treat baskets, heat treat fixtures	AMS 5715, 5870. ASTM B 166, B 167, B 168.
Nickelvac 625 UNS-N06625	Engines, nozzles, combustion and FGD systems, afterburner and spray bars, CPI & nuclear pumps, heat exchangers,	AMS 5666. EB 2949; ASTM B 444, B 446.



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## Nickel-Base

Nickelvac® 400  
 Nickelvac K-500  
 Nickelvac H-X  
**Nickelvac 22**  
 Allvac Allicorr®  
 Nickelvac 600  
 Nickelvac 601  
 Nickelvac 625  
 Nickelvac 690  
 Allvac Waspaloy®  
 Allvac Rene 41®  
 Nickelvac 80 A  
 Nickelvac N-90  
 Allvac M-252  
 Nickelvac 263  
 Allvac 718  
 Allvac 718-OP ®  
 Nickelvac W-722  
 Nickelvac X-750  
 Nickelvac X-751  
 Allvac 330  
 Nickelvac 800 & 800 H  
 Nickelvac 825  
 Allvac 706  
 Nickelvac 901  
 Nickelvac H-N  
 Nickelvac H-W  
 Nickelvac 276  
 Nickelvac HB-2  
 Allvac Astroloy™  
 Allvac 520  
 Allvac 720  
 Allvac 35N  
 Nickelvac L-605  
 Allvac TJA-1537®;

## Nickelvac® 22 (UNS-N06022)

### Composition

Compound	C	Co	Cr	Fe	Mn	Mo	Ni	P	Si	V	W
nominal wt. %	0.07	1.2	21.2	4.0	0.2	13.5	rem	0.01	0.04	0.17	3.0

### Mechanical Properties

Density lb/in <sup>3</sup> (g/cm <sup>3</sup> )	0.290 (8.02)
Metallurgical Condition	2,050 °F anneal
Tensile Strength, ksi (MPa)	115 (793)
0.2% Yield Strength, ksi (MPa)	50 (345)
Elongation, %	60
Reduction in Area, %	70
Typical Hardness	85 HRB

Typical room temperature mechanical properties.

The information, data, and specifications presented here are representative only, and are not guaranteed values. Material or product applications described herein are solely for illustrative purposes and should not be construed as express or limited warranties for fitness for these or other applications.

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**Buchanan Ingersoll PC**

ATTORNEYS

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September 13, 2005

**VIA FACSIMILE AND FIRST CLASS MAIL**

Mr. Francesco Bartalini  
Bartalini Comm. Agt  
Medaglie D'oro 79 55043  
Lido Di Camaiore (Lucca)  
Italy

Re: Use of Haynes Trademarks

Dear Mr. Bartalini:

We represent Haynes International, Inc. As you may know, Haynes has several registered trademarks for the metal alloys that you purchase from Haynes and re-sell to your customers. The marks are listed on the enclosed report from the United States Patent and Trademark Office. While you may use Haynes' trademarks in conjunction with the sale of products that you purchase from Haynes, any use of Haynes' trademarks should indicate that the trademarks you use are trademarks of Haynes International. In addition, you may not offer to sell a product under a Haynes trademark and then substitute an alloy from another manufacturer when an order is received.

It has come to our attention from the enclosed web pages that your company has been offering to sell pipe and tubing that you identify as C-22. If this material was manufactured by Haynes International, Inc. you may identify the material using the Haynes C-22 trademark. If the material was made by another manufacturer, you may not use C-22. The ® designation should appear as a superscript adjacent to the end of the trademark. This designation should be used everywhere the registered mark appears. There should also be a line added that says: "C-22 is a registered trademark of Haynes International, Inc." The ® designations and notice are noted in red where they should appear on the enclosed copies.

Use of the any web pages or any brochures in which the Haynes trademarks appear without those marks being identified as Haynes trademarks constitutes misuse of Haynes trademarks. If such misuse continues Haynes will be required to take legal action against your company to stop the misuse or lose valuable trademark rights.

Please provide your written assurances by September 30, 2005, that you will properly use Haynes trademarks in any future quotes or other documents you produce.

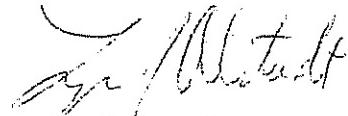
HE 00697

September 13, 2005

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If you have any questions or concerns, please call me.

Very truly yours,



Lynn J. Alstadt

LJA/bem

Enclosures

cc: Paul Manning (w/encl.)

HE 00698



United States Patent and Trademark Office

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**23 Records(s) found (This page: 1 ~ 23)**
 

Current Search: S4: (Haynes)[ON] and (International)[ON] not (Seasol)[ON] and (live)[LD] docs: 23 occ: 71

	Serial Number	Reg. Number	Word Mark	Check Status	Live/Dead
1	76442604	281626B	556	TARR	LIVE
2	76434700		2B2	TARR	LIVE
3	76423154	2785667	D-205	TARR	LIVE
4	76423153	2755568	230-W	TARR	LIVE
5	76423152	2752325	214	TARR	LIVE
6	76423151	2752324	242	TARR	LIVE
7	76400933	2832716	G-35	TARR	LIVE
8	76400932		C-22HS	TARR	LIVE
9	75646170	2532561	625SQ	TARR	LIVE
10	75047108	2023945	HR-120	TARR	LIVE
11	74697077	1982521	230	TARR	LIVE
12	74697076	2002631	C-2000	TARR	LIVE
13	74673214	2063855	B-3	TARR	LIVE
14	74174760	1717465	HR-160	TARR	LIVE
15	74168140	1711142	G-50	TARR	LIVE
16	74023771	1742719	ULTIMET	TARR	LIVE
17	73701791	1600332	G-30	TARR	LIVE
18	73701790	1953864	C-22	TARR	LIVE
19	72159440	0759676	MULTIMET	TARR	LIVE
20	72157340	0756690	MULTIMET	TARR	LIVE
21	71667590	0605011	HASTELLOY	TARR	LIVE
22	71586534	0566221	HAYNES	TARR	LIVE
23	71292933	0269898	HASTELLOY	TARR	LIVE

HE 00699

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## Bartalini Francesco Comm.Agt

### **Sell Aluminum Alloys Pipes [Italy]**

Post Date: March 02, 2005 Expiry Date: March 31, 2005

#### Related Supplier Leads

[Sell Aluminium Hoses](#)[Sell Aluminium Tubes](#)[Sell Pipe](#)[Sell Aluminium Hose](#)[Trade Leads](#)[Products](#)[Company](#)[Trust Profile](#)

We would be happy to quote the best FIRM PRICE for you for the following materials:

**Pipe**

Materials Grades/Alloys Size Ranges

Aluminum Alloys 6061-T6, 6063-T6, 5086, Seamless, Extruded,

Construction Grades

Pipe Sizes from:

1/4 NPS to 12 NPS

Schedules from:

10 to 80

Stainless Steel 304, 304L, 316, 316L, 321, 347, 446, Seamless,

Welded, As Welded, Brewery Quality Pipe Sizes from:

1/8 NPS to 24 NPS

Schedules from:

5 to 120

Nickel Alloys 200, 400, 600, 601, 625, 800HT, C276, C-22, Alloy 20

Pipe Sizes from:

1/8 NPS to 8 NPS

Schedules from:

10 to 80

Carbon Line Pipe, Lacquered, Structural Pipe Sizes from:

1/8 to 12

Schedules from:

5 to 80

Standard lengths Aluminum 24' lls.

Standard lengths 17/24' lls.

Purchased to Applicable industry specifications.

Custom dimensional requirements available upon request.

Quantity: any

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## Information

### SELL | METALS

Post date : 201

Validity : 2005-03-03 ~

Category : Iron or Ferrous Alloy

Dear Sirs,

We can quote the best fir price for:

"Tubing"as down here:

Materials Grades/ Alloys Size Ranges

Aluminum Alloys 2024,3003, 5052, 6061,6063, 7075, Seamless, Extruded, Squares, Rectangles, Structural, Ornamentals

Outside Diameters

1/8" to 12"

Wall thickness' from

.020 to 1 000"

Stainless Steel 303,304,304L, 316, 316L, 321, 347 ,PH grades, Seamless, Welded and Drawn, As welded, instrumentation, S

Rectangles, Polished, Sanitary, Hypodermic Outside Diameters

.009" to 10"

Wall thickness' from

.0025 to 2 000"

Nickel Alloys 200, 400, 600, 601, 625, 800H, 825, C276, C-22, Alloy 20 Outside Diameters

.009" to 10"

Wall thickness' from

.0025 to 2 000

Titanium CP, 3AL - 2 5V, Ducting Outside Diameters from 1/4"

Wall thickness' from .020"

Alloy 4130, 4340, 8620, 52100, Squares, Rectangles, Streamline Outside Diameters

3/16" to 10"

Wall thickness' from

.028" to 1 000"

Carbon Low Carbon 1020, 1026, DOM, Seamless, As Welded, Hydraulic, Mechanical, Aircraft, Structural Shapes Outside Dia

.125" to 16"

Wall thickness' from

.020" to 3"

Standard lengths Aluminum 12'

Standard lengths other than Aluminum 17/24' rls

Purchased to Applicable industry specifications

HE 00702

Custom dimensional requirements available upon request

P S We also deal Rod, Bar & Wire,Pipe,Plate&Coil and Sheet products.

Let us know your requests

Thank you

Bartalini Trade Agents

*C-ZZ is a registered trademark of Haiger International, Inc.*

#### Member Information

• Name	Francesco Bartalini	• Company	Bartalini
• Country	Italy	• Fax	39-0584-699900
• Telephone	39-0584-610066		
• Address	Medaglie d'oro 79 Lido Di Camaiore Lucca		
• Homepage			

« »

 Offer Scrap  In

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**Buchanan Ingersoll PC**

ATTORNEYS

Lynn J. Alstadt  
 412 562 1632  
 alstadtlj@bjpc.com

One Oxford Centre  
 301 Grant Street, 20th Floor  
 Pittsburgh, PA 15219-1410  
 T 412 562 8800  
 F 412 562 1041  
 www.buchananingersoll.com

September 12, 2005

**VIA FACSIMILE AND FIRST CLASS MAIL**

S. Don Kim, President/CEO  
 Cbol Corporation  
 21300 Victory Boulevard  
 Woodland Hills, CA 91367-7727

**Re: Use of Haynes Trademarks**

Dear Mr. Kim:

We represent Haynes International, Inc. As you know, Haynes has several registered trademarks for the metal alloys that you purchase from Haynes and re-sell to your customers. The marks are listed on the enclosed report from the United States Patent and Trademark Office. While you may use Haynes' trademarks in conjunction with the sale of products that you purchase from Haynes, any use of Haynes' trademarks should indicate that the trademarks you use are trademarks of Haynes International. In addition, you may not offer to sell a product under a Haynes trademark and then substitute an alloy from another manufacturer when an order is received.

Enclosed is a copy of your web pages in which two of Haynes' registered trademarks HASTELLOY and C-22 are used incorrectly. We, therefore, ask that you immediately make the corrections described below and noted in red on the enclosed copies.

The ® designation should appear as a superscript adjacent to the end of each trademark. This designation should be used everywhere the registered mark appears. There should also be a line added that says: "HASTELLOY and C-22 are registered trademarks of Haynes International, Inc."

Continued use of the enclosed web pages or any brochures in which the Haynes trademarks appear without being identified as such constitutes misuse of Haynes trademarks. If such misuse continues Haynes will be required to take legal action against your company to stop the misuse or lose valuable trademark rights. It is our hope that you will make the requested changes to those web pages so that Haynes is not forced to choose between suing an important customer or losing its trademark rights.

Please tell me by September 30, 2005, whether you will change your web pages and, if so, when the change will be made.

HE 00704

September 12, 2005

Page - 2 -

Should you decide to use any Haynes trademarks in any future web pages, brochures or advertisements, I suggest that you send a draft to me or Paul Manning at Haynes International for review before the web page, brochure or advertisement is published. We will promptly review your publication and correct any incorrect use of a Haynes trademark.

If you have any questions or concerns, please call me.

Very truly yours,



A handwritten signature in black ink, appearing to read "Lynn J. Alstadt".

Lynn J. Alstadt

LJA/bem

Enclosures

cc: Paul Manning (w/encl.)

HE 00705



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## Trademarks > Trademark Electronic Search System(Tess)

TESS was last updated on Sat Sep 10 04:12:50 EDT 2005



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At:

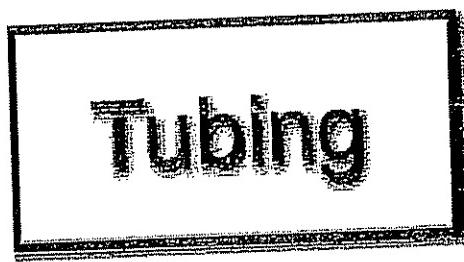
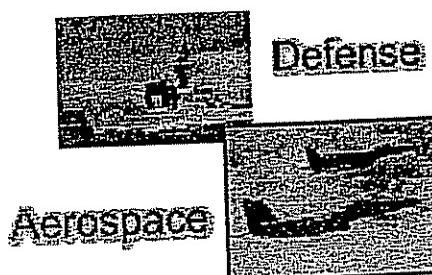
OR  to  
record:

**23 Records(s) found (This page: 1 ~ 23)**

Refine Search (Haynes)[ON] and (International)[ON] not ()   
Current Search: S4: (Haynes)[ON] and (International)[ON] not (Seasol)[ON] and (live)[LD] docs: 23 occ: 71

Serial Number	Reg. Number	Word Mark	Check Status	Live/Dead
1	76442604	2816268	556	TARR
			282	TARR
2	76434700			LIVE
3	76423154	2785667	D-205	TARR
4	76423153	2755568	230-W	TARR
5	76423152	2752325	214	TARR
6	76423151	2752324	242	TARR
7	76400933	2832716	G-35	TARR
8	76400932		C-22HS	TARR
9	75646170	2532561	625SQ	TARR
10	75047108	2023945	HR-120	TARR
11	74697077	1982521	230	TARR
12	74697076	2002631	C-2000	TARR
13	74673214	2063855	B-3	TARR
14	74174760	1717465	HR-160	TARR
15	74168140	1711142	G-50	TARR
16	74023771	1742719	ULTIMET	TARR
17	73701791	1600332	G-30	TARR
18	73701790	1953864	C-22	TARR
19	72159440	0759676	MULTIMET	TARR
20	72157340	0756690	MULTIMET	TARR
21	71667590	0605011	HASTELLOY	TARR
22	71586534	0566221	HAYNES	TARR
23	71292933	0269898	HASTELLOY	TARR

HE 00706



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## PRODUCT LINE

Materials	Grades/Alloys	Size Ranges
Aluminum Alloys	2024, 3003, 5052, 6061, 6063, 7075, Seamless, Extruded, Squares, Rectangles, Structural, Ornamentals	Outside Diameters 1/8" to 12" Wall Thickness from .020" to 1.000"
Stainless Steel	303, 304, 304L, 316, 316L, 321, 347, PH grades, Seamless, Welded and Drawn, As Welded, Instrumentation, Squares, Rectangles, Polished, Sanitary, Hypodermic	Outside Diameters .009" to 10" Wall Thickness from .0025" to 2.000"
Nickel Alloys	200, 400, 600, 601, 625, 800H, 825, C276, C-22, Alloy 20	Outside Diameters .009" to 10" Wall Thickness from .0025" to 2.000"
Titanium	CP, 3AL-2.5sn, Ducting	Outside Diameters from 1/4" Wall Thickness from .020"
Alloy	4130, 4340, 8620, 52100, Squares, Rectangles, Streamline	Outside Diameters 3/16" to 10" Wall Thickness from .028" to 1.000"
Carbon	Low Carbon 1020, 1026, COM, Seamless, As Welded, Hydraulic, Mechanical, Aircraft, Structural Shapes	Outside Diameters .125" to 16" Wall Thickness from .020" to 3"

C-22 is a registered trademark of Hayes International, Inc.

HE 00707

EC 0316

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- PCBs & Wire Harnesses**
- Precision Metal Parts**
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- Seatbelts**

**Variety of Materials and Processes**

CBOL's wide range of products and sources ensures that we can satisfy the ever-evolving metals market. We supply an array of materials, including **aluminum, stainless steel, titanium, nickel alloys, copper, bronze, brass, specialty steels** and more. In addition to the many types and grades of metals, we can also source **structurals, custom shapes** such as **angles and channels and laminated shims**. CBOL specializes in hard to find sizes and shapes.



**CBOL also provides services that make it a one-stop shop for metals processes:** the aerospace, automotive, and industrial industries. Our capabilities include: types of **shearing and precision cutting, heat-treating, grinding, slitting, leveling**. Our materials and processes will meet the most exacting requirements.

**Value-Added**

CBOL coordinates the logistics for all ocean, air and ground transportation. We provide technical, business, and consulting support for companies operating in the rapidly changing international marketplace. We provide efficient export packaging including Hazmat packing and shipping, IPPC/HT treatment specifications for wooden crates, documentation, kitting, LTA/JIT/AOG, as well as required export license. Our global power allows us to achieve lower freight costs by consolidating shipping containers.

**Certified Quality**

CBOL supplies products produced by approved sources that are certified to major international standards for manufacturing and quality control. Our network of approved sources brings you diversity in design, a wide selection of alloys, critical dimensions, which are delivered when and where you need them. Our suppliers are under ISO 9001 guidelines.

---

#### Materials and Specifications

---

**CBOL supports a wide variety of plate, tread plate, sheet and coil metals as well as square, rectangular, and hex bar stock from approved U.S. sources. We bring over 15 years experience as an aircraft quality metals distributor. Our close relationships with suppliers throughout the U.S. allow us to be extremely competitive regardless of the size or location of the requirement.**

**Aluminum**  
1100, 2024, 3003, 5052, 6061,

7075

**Stainless Steel**

**Nickel Alloy**  
METCO, A286,  
INCONEL,  
HASTELLOY, RENE,  
MONEL

**Processes**  
**Shearing** •  
**Precision Saw**  
**Grinding** • **C**

15-5PH, 17-4PH, H1150, 13-8,  
13-3, 303, 304, 316, 321, 416SU

Titanium  
CP GR, 1,2,3, 6AL-4V-GR.5,  
0.20pd-GRADE 7, 3AL, ELI, CP90

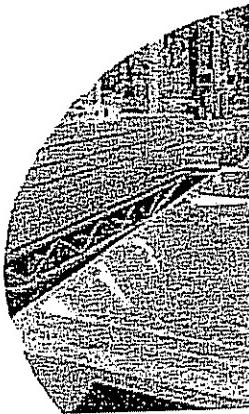
Copper  
CDA 110, 145, S875, T590, TF00,  
C11000, 17510, 10100

Bronze  
SAE660, 642, 675, 954, CDA630  
DYNALLOY, 630, 954

Aircraft Alloy  
4130, 4140, 4340,  
D6AC VM, 4330M  
VAR

Brass  
CDA 260, 360, 464

Specialty Steel  
M4, M6  
(electric oriented)



HASTELLOY is a registered trademark of Haynes International, Inc.

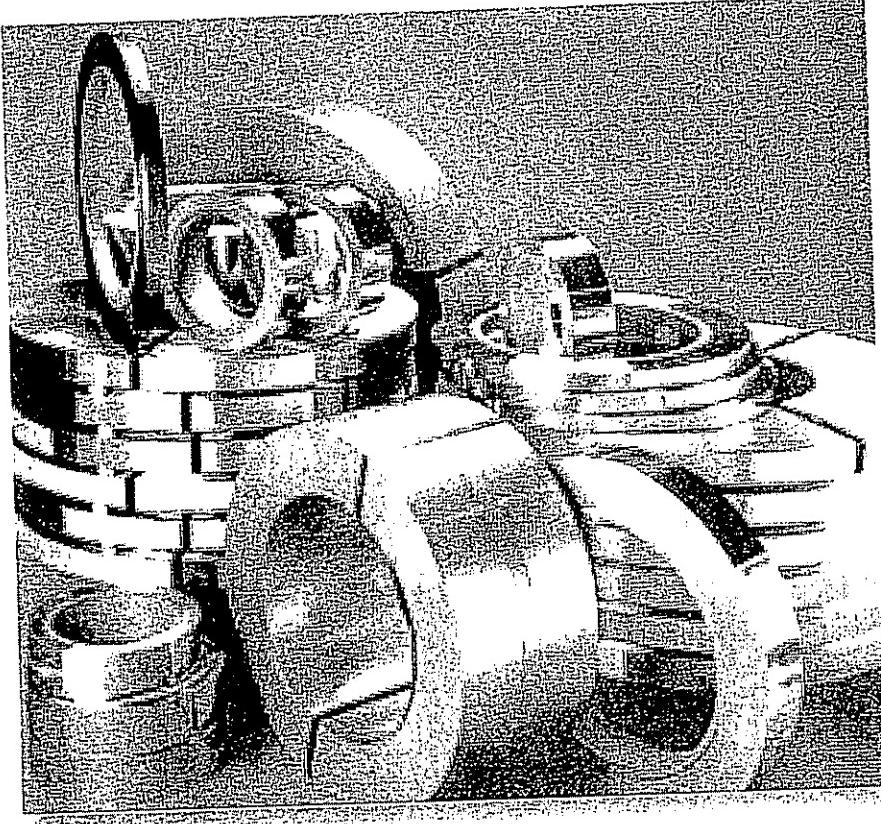
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TECHNICAL

## Approved Sources

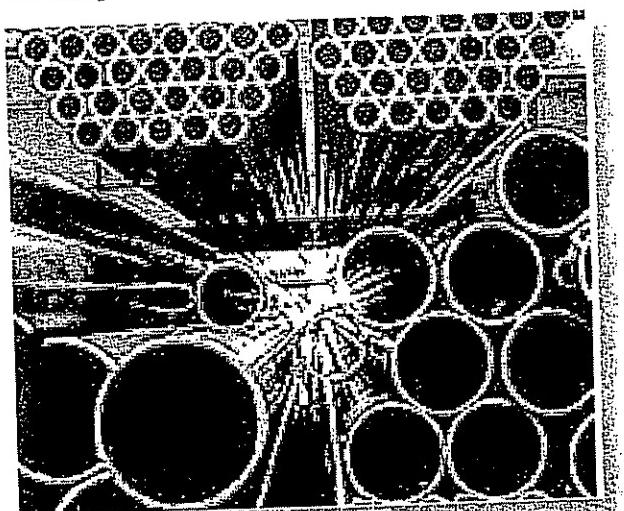
CBOL is able to supply a wide variety of plate, sheet, coil and shaped metals such as round, square, hex and other shapes in bar stock and tubular form from approved sources. Our staff brings over 100 years of combined experience as an aircraft quality metals distributor. Our close relationships with mills throughout the U.S. allow us to be extremely competitive regardless of the size and location of the requirement.



## Variety of Materials and Shapes

CBOL's range of products and sources ensures that we can satisfy the ever-evolving metals market. We supply an array of materials including, **aluminum, stainless steel, titanium, nickel alloys, copper, bronze, brass, specialty steels** and more. In addition to the many types and grades of metals, we can also source structurals, custom shapes such as angles and channels and laminated shims. CBOL specializes in hard to find sizes and shapes.

CBOL also provides services that make it a one-stop shop for metals processes serving the aerospace, industrial, automotive and military industries. Our capabilities include several types of shearing and precision cutting, heat treating, grinding, slitting and leveling. Our materials and processes will meet the most exacting requirements.



## Value-Added

CBOL's value-added services ensure that you receive products that conform to your specifications and delivery timetable. We provide export packaging for all modes of international shipment, conforming to all international shipping standards including the NPQO treatment spec for wooden crates. With Just-In-Time delivery, export licensing, Cut-To-Size per customer's drawing requirement and Long Term Agreement, we are ready to design a supply package that meets your needs and reduces your overall product cost.

## Certified Quality

CBOL's network of approved sources brings you diversity in design, a wide selection of alloys, critical dimensions and close tolerances resulting in high quality products. Every metal product is manufactured to meet U.S. and international standards for quality, reliability, durability and traceability. All our suppliers operate under ISO 9001 guidelines.

*CBOL Corporation... offering international customers convenient and reliable access to quality products and components.*

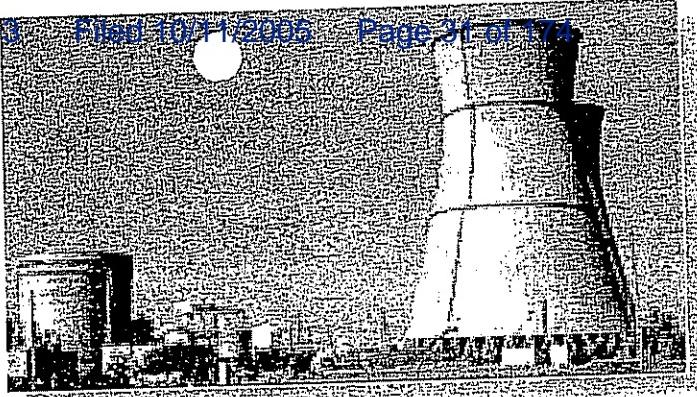
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**YOUR Worldwide Material Resource**

**CBOL Corporation** | Integrated Metal Solutions

**METALS****Markets**

- Aerospace • Military
- Commercial • Automotive
- Industrial • Powerplant

**Materials and Specifications**

CBOL supports a wide variety of plate, tread plate, sheet and coil metals as well as round, hex and square bars. Structural and custom shapes such as angles, channels and laminated shims are available upon request.

**Aluminum**

1100, 2024, 3003,  
5052, 6061, 7075

**Stainless Steel**

15-5PH, 17-4PH, H1150,  
13-8, 13-3, 303, 304,  
316, 321, 416SU

**Titanium**

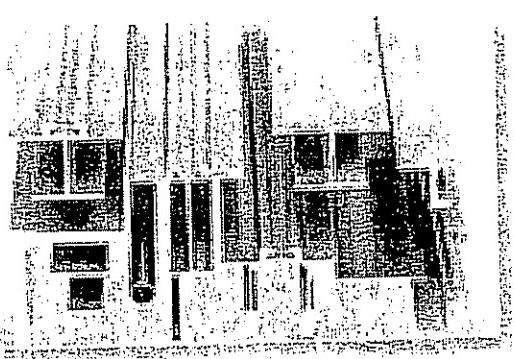
CP GR, 1, 2, 3,  
6AL-4V-GR.5,  
0 20pd-GRADE 7,  
3AL, ELI, CP90

**Copper**

CDA 110, 145, S875, T590,  
TF00, C11000, 17510, 10100

**Bronze**

SAE660, 642, 675, 954, CDA630  
DYNALLOY, 630, 954

**Nickel Alloy**

METCO, A286  
INCONEL  
HASTELLOY  
RENE, MONEL

**Aircraft Alloy**

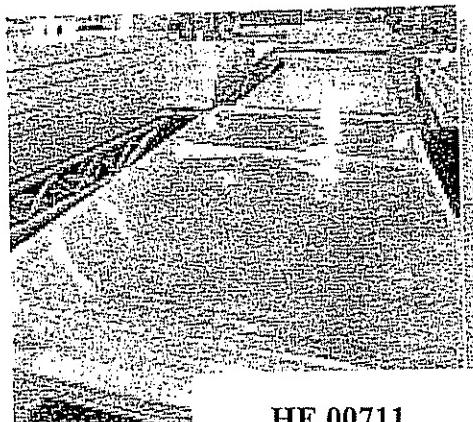
4130, 4140, 4340  
D6AC VM,  
4330M VAR

**Brass**

CDA 260,  
360, 464

**Specialty Steel**

M4, M6  
(electric oriented)



HE 00711

**Capability and Experience**

CBOL Corporation is a U.S.-based full-service provider supplying high quality products, engineering services and business consulting to its international customers in the automotive, aerospace, defense and electronics industries. CBOL offers its customers a one-stop source for a wide range of approved materials and parts.

**Value Added Service**

CBOL coordinates the logistics for all ocean, air and ground transportation. We provide efficient export packaging including HazMat packing and shipping, IATA documentation, kitting and LTL/JIT/ADG, as well as required export licenses. Our buying power allows us to achieve lower freight costs by consolidating shipping containers.

**Certified Quality**

CBOL supplies products produced by approved sources that are certified to meet all U.S. and international standards for manufacturing and quality control.

**Processing**

- Shearing • Precision Sawing
- Leveling • Slitting
- Grinding • Chem Milling

**CBOL** CORPORATION

21300 Victory Boulevard, Suite 800  
Woodland Hills, CA 91367  
Phone: 818-704-8200 Fax: 818-704-4336  
info@cbol.com www.cbol.com

This is acceptable notice

SEP-13-2005 15:49

B18 704 4336 P.01/03



21300 VICTORY BLVD. STE 800  
WOODLAND HILLS, CALIFORNIA 91367  
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FASCIMILE (818) 704-4336  
[www.cbol.com](http://www.cbol.com)

**To:** **Lynn Alstadt**  
Buchanan Ingersoll PC

**Fax:** **412-562-1041**

**From:** **Abby Walsh**

**Fax:** **818 704 4336**      **Telephone:** **818 337 1643**

**Date:** **September 13, 2005**

**Number of Pages:** **3 (including cover sheet)**

---

**CONFIDENTIAL DOCUMENT ENCLOSED**

Lynn,

Please see attached.

Thank you,

Abby

cc

HE 00712

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 Phone (818) 704-8200  
 Facsimile (818) 704-4336  
[www.cbcl.com](http://www.cbcl.com)

Abigail C. Walsh  
 818 337 1643  
[abbywalsh@cbcl.com](mailto:abbywalsh@cbcl.com)

September 13, 2005

VIA FACSIMILE

Lynn J. Alstadt  
 Buchanan Ingersoll PC  
 One Oxford Centre  
 301 Grant St., 20<sup>th</sup> Flr.  
 Pittsburgh, PA 15219

Re: Use of Haynes Trademarks

Dear Ms. Alstadt:

I am in receipt of your letter dated September 12, 2005. We are happy to work with you on your recent requests.

While we do sell products bearing the Haynes trademark, we do not reproduce or copy the trademarks in any other manner, except to refer to the products in our paperwork, such as invoices, and on our website. Further, we do not specifically sell a Haynes product to our customer and then provide product from another manufacturer. We will assume these were simply guidelines which you were providing.

With regard to your trademark request for the product C22, we are currently in the process of creating a new website. Therefore the page, a copy of which you provided and is date stamped EC0316, which refers to C-22 as one of the Nickel Alloys in our product line, has been removed from the website entirely.

Our new website does refer to "Hastelloy" under our Metals product lines. We apologize for the omission of the copyright designation and will make arrangements to have a "C" added as soon as possible. Thank you for bringing this to our attention.

You also requested that we insert at the bottom of the page the following: "Hastelloy is a registered trademark of Haynes International, Inc." Because we carry so many different lines and have permission to use copyrighted materials from many different sources on our site, it would be very difficult to provide language referring to every trademark, on every page. We have resolved this issue, as is common practice, by generally referring to the use of other companies' trademarks in our Terms of Use and Privacy. We hope this will suffice.

Our brochure, which is downloadable from the website, also refers to "Hastelloy." You asked that we put a trademark designation of "R" here. We are able to do this quickly on the downloadable brochure and will make arrangements to have this added as soon as possible.

HE 00713

SEP-13-2005 15:49



September 13, 2005  
Page 2

As you can appreciate, we face a bit more of a challenge with our printed material as we have many of boxes of brochures printed without your trademark sign. Perhaps you and I can speak at your convenience and discuss how best to address this issue.

We thank you for making us aware of this important matter and I look forward to speaking with you.

Regards,

  
Abigail Walsh  
General Counsel  
CBOL Corporation

HE 00714

RE: Use of Haynes trademarks

**Alstadt, Lynn**

---

**From:** Abby Walsh [Abbywalsh@cbol.com]  
**Sent:** Thursday, September 15, 2005 7:50 PM  
**To:** Alstadt, Lynn  
**Cc:** Don Kim  
**Subject:** RE: Use of Haynes trademarks

Lynn:

Thanks for your cooperation.

Abby Walsh  
Abigail Walsh  
21300 Victory Blvd., Suite 800  
Woodland Hills, CA 91367  
Main: 818-704-8200  
Direct: 818-337-1643  
Fax: 818-704-4336  
[abbywalsh@cbol.com](mailto:abbywalsh@cbol.com)

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---Original Message---

**From:** Alstadt, Lynn [SMTP:[alstadtlj@bipc.com](mailto:alstadtlj@bipc.com)]  
**Sent:** Thursday, September 15, 2005 3:08 PM  
**To:** Abby Walsh  
**Cc:** Paul Manning  
**Subject:** Use of Haynes trademarks

Abby,

This is in response to your letter of September 13, 2005 and our conversation yesterday. We appreciate your willingness to place the R in a circle designation next to Haynes trademarks when used on your company's website. We agreed that the statement concerning trademarks in your Terms of Use and Privacy section of the website makes it unnecessary for you to place the statement that "HASTELLOY is a registered trademark of Haynes International, Inc." on pages where the HASTELLOY trademark appears

We agreed that CBOL Corporation may continue to distribute your brochures in which HASTELLOY appears in capital letters but without the (R). However, when the brochures are reprinted you will add the (R) designation. You will also use the (R) designation with any Haynes marks that appear in any new brochures or web pages.

Thank you for your cooperation.

HE 00715

Lynn J. Alstadt  
Buchanan Ingersoll P. C.  
301 Grant Street  
Pittsburgh, Pennsylvania 15219-1410  
Phone: 412-562-1632  
Fax: 412-562-1041

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**Buchanan Ingersoll PC**

ATTORNEYS

Lynn J. Alstadt  
 412 562 1632  
 alstadtlj@bipc.com

One Oxford Centre  
 301 Grant Street, 20th Floor  
 Pittsburgh, PA 15219-1410  
 T 412 562 8800  
 F 412 562 1041  
 www.buchananingersoll.com

April 25, 2005

**VIA FACSIMILE AND FIRST CLASS MAIL**

Mr. Ron Campbell  
 Corrosion Materials  
 2262 Groom Road  
 Post Office Box 666  
 Baker, LA 70714

**Re: Use of Haynes Trademarks**

Dear Mr. Campbell:

We represent Haynes International, Inc. As you know, Haynes has several registered trademarks for the metal alloys that you purchase from Haynes and re-sell to your customers. While you may use Haynes' trademarks in conjunction with the sale of products that you purchase from Haynes, any use of Haynes' trademarks should indicate that the trademarks you use are trademarks of Haynes International. In addition, you may not offer to sell a product under a Haynes trademark and then substitute an alloy from another manufacturer when an order is received.

Enclosed is a copy of your brochures Hastelloy Alloy C-276 and Hastelloy Alloy C-22 in which several Haynes' registered trademarks are used incorrectly. We, therefore, ask that you immediately stop using these brochures and reprint them after making the corrections described below and noted in red on the enclosed copies.

Both brochures contain the Haynes trademarks HASTELLOY, C-22 and G-30. The last page of the brochure near the bottom says "HASTELLOY is a trademark of HAYNES INTERNATIONAL, INC." That notice should include all Haynes' trademarks that appear in the brochure. In addition, the ® designation should appear as a superscript adjacent to the end of each trademark. This designation should be used everywhere the registered mark appears. Enclosed are copies of your brochure with the ® designations noted in red where they should appear.

The last page of both brochures contains the statement "HASTELLOY B-2, C-22, G-30." Since Haynes has not manufactured HASTELLOY B-2 alloy for many years, if you are currently selling a B-2 alloy you must be buying that alloy from another manufacturer. Consequently, B-2 must be deleted from the phrase noted above. This is also noted on the enclosed copies.

HE 00717

April 25, 2005

Page - 2 -

Continued use of the enclosed brochures constitutes misuse of Haynes trademarks. If such misuse continues Haynes will be required to take legal action against your company to stop the misuse or lose valuable trademark rights. It is our hope that you will not continue using the current brochure and thereby force Haynes to choose between suing an important customer and losing its trademark rights.

Please tell me by May 1, 2005, whether you will change your brochure and if so, when the new brochures will be in use.

Should you decide to use any Haynes trademarks in any future brochures or advertisements, I suggest that you send a draft to me or Paul Manning at Haynes International for review before the brochure or advertisement is published. We will promptly review your publication and correct any incorrect use of a Haynes trademark.

If you have any questions or concerns, please call me.

Very truly yours,



Lynn J. Alstadt

LJA/bem

Enclosures

cc: Paul Manning (w/encl.)  
Greg Spalding (w/encl.)

HE 00718

RECEIVED

MAY 2 2005

BUCHANAN INGERSOLL LTD.



1-800-535-B032 • 2262 Groom Road • P. O. Box 630 • Baker, Louisiana 70714

April 28, 2005

Ms. Lynn J. Alstadt  
Buchanan Ingersoll  
One Oxford Center  
301 Grant Street, 20<sup>th</sup> Floor  
Pittsburgh, Pa. 15219

Dear Ms. Alstadt,

Please reference your letter of April 25, 2005. We have removed the Hastelloy® C-276 and C22® brochures from all areas that might result in an inadvertent distribution and they will be destroyed. We have been in the process of removing the offending trademarks as brochures were depleted, but will accelerate that process. While we do continue to stock and sell Hastelloy® C-276 and Hastelloy® C-22®, we do indeed stock materials from other manufacturers. We never misrepresent our stock offering and always advise any customer specifying Hastelloy® that we are offering an alternate to Hastelloy® when that is the case. We will continue to be careful about our representation in the future.

Yours truly,

Ronald P. Campbell

HE 00719



**Buchanan Ingersoll PC**

ATTORNEYS

Lynn J. Alstadt  
 412 562 1632  
 alstadtlj@bipc.com

One Oxford Centre  
 301 Grant Street, 20th Floor  
 Pittsburgh, PA 15219-1410

T 412 562 8800  
 F 412 562 1041  
 www.buchananingersoll.com

September 9, 2005

**VIA FACSIMILE AND FIRST CLASS MAIL**

Mr. Ron Campbell  
 Corrosion Materials  
 2262 Groom Road  
 Post Office Box 666  
 Baker, LA 70714

Re: Use of Haynes Trademarks

Dear Mr. Campbell:

This is further to our telephone conversation on Wednesday, September 6, and our exchange of correspondence concerning your use of Haynes' trademarks in your brochures Hastelloy Alloy C-276 and Hastelloy Alloy C-22. We appreciate the fact that you have discontinued these brochures and recognize that the Haynes trademarks must be used properly.

When we spoke on Wednesday, I told you that Haynes has sued Electralloy for infringement of its C-22 trademark. Enclosed are web pages of Corrosion Materials provided to us by Electralloy's attorneys in which Haynes' trademarks appear, but are not identified as Haynes' trademarks.

While you may use Haynes' trademarks in conjunction with the sale of products that you purchase from Haynes, any use of Haynes' trademarks must indicate that the trademarks you use are trademarks of Haynes International, Inc. Consequently, on each of the enclosed pages I have identified the Haynes' trademarks and noted an ® next to each mark. In those instances where the trademark is used in a sentence as a noun rather than an adjective I have inserted the correct noun.

Continued use of the enclosed web pages without the noted changes constitutes misuse of Haynes' trademarks. If such misuse continues Haynes will be required to take legal action against your company to stop the misuse or lose valuable trademark rights. It is our hope that you will correct or discontinue the use of those pages as you did the two brochures rather than thereby force Haynes to choose between suing an important customer and losing its trademark rights.

HE 00720

September 9, 2005

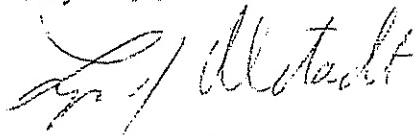
Page - 2 -

Please tell me by September 20, 2005, whether you will change or discontinue using the enclosed materials and if so, when the new corrected pages will be in use.

Should you decide to use any Haynes trademarks in any future brochures or advertisements, I suggest that you send a draft to me or Paul Manning at Haynes International for review before the brochure or advertisement is published. We will promptly review your publication and correct any incorrect use of a Haynes trademark.

If you have any questions or concerns, please call me.

Very truly yours,



Lynn J. Alstadt

LJA/bem

Enclosures

cc: Paul Manning (w/encl.)

HE 00721



**RHTIV** ISO 9001  
ISO Registered Since 1993

Corrosion Material's Alloy C-22 is a fully austenitic, nickel-chromium-molybdenum-tungsten alloy with better overall corrosion resistance compared to other nickel-chromium-molybdenum alloys, including C276, C4 and Alloy 625. The high chromium content provides good resistance to oxidizing media while the molybdenum and tungsten content give good resistance to reducing media. Some applications for Alloy C-22 include waste incinerators, waste water processing, pollution control (flue-gas desulfurization), nuclear fuel reprocessing/spent fuel containers, pickling systems, chemical manufacturing, just to name a few.

Maximum service temperature for Alloy C-22 is 1250°F due to the formation of detrimental phases which form above this temperature.

### Resistance to Corrosion

Alloy C-22 displays exceptional resistance to a broad range of corrosive environments. It has excellent resistance to oxidizing aqueous media including wet chlorine and mixtures containing nitric acid or oxidizing acids with chlorine ions. Resistance to reducing acids such as sulfuric and hydrochloric can also be expected. Other corrosive chemicals to which the alloy has resistance are oxidizing acid chlorides, wet chlorine, formic and acetic acids, ferric and cupric chlorides, sea water, brine and many mixed or contaminated chemical solutions, both organic and inorganic. Alloy C-22 also offers optimum resistance to environments where reducing and oxidizing conditions are encountered in process streams. This is beneficial in multi-purpose plants where such "upset" conditions occur frequently.

### Fabrication and Heat Treatment

Alloy C-22 can be formed using standard processes used for Ni alloys. Although ductile enough to be formed by cold working, intermediate annealing may be necessary due to work hardening. Forging should be between 1750°F and 2050°F followed by rapid cooling. Annealing can be performed at a temperature between 2020°F and 2150°F followed by a rapid quench. Cooling at an accelerated rate avoids the formation of detrimental phases which form between 1400°F and 1800°F. Welding can be by gas tungsten-arc, gas metal-arc, and shielded metal-arc processes.

### Chemical Composition

Ni.....	Balance	S.....	0.02 Max.	W.....	2.5 - 3.5	V.....	0.35 Max.
Cr.....	20.0 - 22.5	C.....	0.015 Max.	Fe.....	2.0 - 6.0	Mn.....	0.50 Max.
Mo.....	12.5 - 14.5	P.....	0.02 Max.	Co.....	2.5 Max.	Si.....	0.08 Max.

Alloy C-22

UNS N06022 / W.Nr. 2.4602

### Mechanical Properties

Typical Room Temperature Tensile Properties of Annealed Material				
Product Form	Tensile (ksi)	0.2% Yield (ksi)	Elongation (%)	Hardness (HRB)
Plate (0.25" - 1.75")	112	53	62	89
Sheet (0.038" - 0.15")	122	63	54	93
Bar (0.50" - 5.50")	115	55	60	89

### Cold-Worked Sheet Properties

Percent Cold Reduction	Tensile (ksi)	0.2% Yield (ksi)	Elongation (%)
10%	130	93	39
20%	151	127	23
30%	170	151	13
40%	192	174	9
50%	206	183	10

### Average Impact Strength

Product Form	Condition	V-Notch Impact Strength
Plate	Heat-treated at 2050°F, Rapid Quench	Room Temp. - 260 ft.-lb. -320°F - 259 ft.-lb.

\* - Specimens did not break.

### Physical Properties

Density@ Room Temp.	0.314 lb/in. <sup>3</sup>
Elastic Modulus @ 70°F	29.9 x 10 <sup>6</sup> psi
Melting Point	2475°F - 2550°F
Specific Heat @ 126°F	0.099 Btu/lb.°F
Thermal Conductivity @ 118°F	70 Btu-in/ft <sup>2</sup> ·h·°F
Permeability @ 200 oersted (15.9 kA/m)	≤1.001
Electrical Resistivity @ Room Temp.	44.8 μΩ·m

### Coefficient of Thermal Expansion

Temperature - °F	Coefficient - μin./in.°F
200	6.9
400	6.9
600	7.0
800	7.4
1000	7.7
1200	8.1

## Aqueous Corrosion Data

Media	Common Name	Temp. °F (°C)	Corrosion Rate (mpy)
99% $\text{CH}_3\text{O}_2$	Acetic Acid	Boiling	Nil
10% $\text{FeCl}_3$	Ferric Chloride	Boiling	1
88% $\text{CH}_3\text{O}_2$	Formic Acid	Boiling	<1
1% HCl	Hydrochloric Acid	Boiling	3
5% HCl	Hydrochloric Acid	158 (70)	19
10% HCl	Hydrochloric Acid	Boiling	400
5% HCl + 42 g/l $\text{Fe}_2(\text{SO}_4)_3$	Mixed Acid	150 (66)	2
5% HCl + 2% HF	Mixed Acid	158 (70)	59
5% HF	Hydrofluoric Acid	158 (70)	14
85% $\text{H}_3\text{PO}_4$	Phosphoric Acid	Boiling	13
44% $\text{P}_2\text{O}_5$	Phosphoric Oxide	240 (116)	21
38% $\text{P}_2\text{O}_5$ + 2000 ppm Cl	Mixed Acid	185 (85)	1
38% $\text{P}_2\text{O}_5$ + 0.5% HF	Mixed Acid	185 (85)	7
10% $\text{HNO}_3$	Nitric Acid	Boiling	<1
65% $\text{HNO}_3$	Nitric Acid	Boiling	134
5% $\text{HNO}_3$ + 6% HF	Mixed Acid	140 (60)	67
5% $\text{HNO}_3$ + 25% $\text{H}_2\text{SO}_4$ + 4% NaCl	Mixed Acid	Boiling	<1
5% $\text{HNO}_3$ + 1% HCl	Mixed Acid	Boiling	2
5% $\text{HNO}_3$ + 2.5% HCl	Mixed Acid	126 (52)	4
8.8% $\text{HNO}_3$ + 15.8% HCl	Sulfuric Acid	Boiling	5
2% $\text{H}_2\text{SO}_4$	Sulfuric Acid	Boiling	12
10% $\text{H}_2\text{SO}_4$	Sulfuric Acid	Boiling	33
20% $\text{H}_2\text{SO}_4$	Sulfuric Acid	174 (79)	16
50% $\text{H}_2\text{SO}_4$	Sulfuric Acid	199 (93)	68
80% $\text{H}_2\text{SO}_4$	Mixed Acid	194 (90)	94
10% $\text{H}_2\text{SO}_4$ + 1% HCl	Mixed Acid	158 (70)	11
25% $\text{H}_2\text{SO}_4$ + 200 ppm Cl <sup>-</sup>	ASTM G28B	Boiling	8
23% $\text{H}_2\text{SO}_4$ + 1.2% HCl + 1% $\text{FeCl}_3$ + 1% $\text{CuCl}_2$	ASTM G28A	Boiling	40
50% $\text{H}_2\text{SO}_4$ + 42g/l $\text{Fe}_2(\text{SO}_4)_3$	ASTM G28A	Boiling	

## Applicable Specifications

Alloy C-22	Form	ASTM	ASME	Stahl-Eisen-Profilblatt	VdTÜV European Standard
Bar	Bar	B564 <sup>1</sup> , B574, G28-A/B	SB564 <sup>1</sup> , SB574	1877 Method II	479 <sup>2</sup> EN10204 - 3.1.B
Plate/Sheet/Strip	Plate	A480 <sup>3</sup> , B575, G28-A/B	SB 575	1877 Method II	479 EN10204 - 3.1.B
Seamless Tube/Pipe	Tube	B622, G28-A/B	SB622	1877 Method II	/ EN10204 - 3.1.B
Welded Tube	Tube	B626 Class III <sup>4</sup> , G28-A/B	SB626 Class III <sup>4</sup>	1877 Method II	/ EN10204 - 3.1.B
Welded Pipe	Pipe	B619 <sup>5</sup> Class I or II, B775 <sup>6</sup> , G28-A/B	SB619 <sup>5</sup> Class I or II, SB775 <sup>6</sup>	1877 Method II	/ EN10204 - 3.1.B

1. Applicable to 3 1/2" diameter and above. 2. Haynes International Material only. 3. Specification for flatness. 4. Bead-worked and annealed. 5. Up to and including 8" schedule 40. 6. Above 8" schedule 40, annealed with no filler.

Please contact Corrosion Materials for a complete list of available items from inventory.

In-house machine and weld facilities help insure that the most common items will be in stock. Items not in stock can be fabricated in a short period of time either in-house or through our extensive, approved subcontractor and supplier network.

C-22

We also supply a complete range of items in the following alloys: Alloy C276, Inconel® 686, B-2, B-3®, G-30®, Alloy 31, F-255, 200/201, Alloy 400 and 600. Bar products are also available in Alloy 20, K500, 800H/HT, Stellite® 6B and 718OP, as well as various Ti grades.

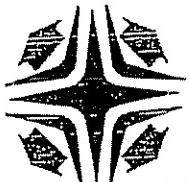
Inconel® is a registered name of Special Metals Company. Inconel® 686 is a patented alloy of Special Metals Company. B-30 and G-30® are registered trademarks of Haynes International Inc. Stellite® is a registered trademark of Delco Stellite Co.

The data and information contained in this pamphlet have been taken from open literature and is believed to be reliable. The information contained is intended to be used as a guide. Corrosion Materials does not make any warranty or assume any legal liability for its accuracy, completeness or usefulness.

## Domestic & Export

2262 Groom Road, P.O. Box 630  
Baker, Louisiana 70714  
(800) 535-8032 • (225) 775-3675  
FAX: (225) 774-0514

24-Hour Emergency Service



[www.corrosionmaterials.com](http://www.corrosionmaterials.com)

Pricing Available Online or Web Site

HE 00723

TEXAS

5092 Steadmont  
Houston, Texas 77040  
(800) 455-2276 • (713) 939-0364  
FAX: (713) 939-1126

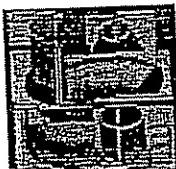
EC 0255



Alloy Quick Select



(C) ANY C OR G AND



## Available Documents

- Credit Application (.pdf, 73kb)(MS Word 97, 39kb)

## C-22 (R) Alloy Specification Sheets

- Alloy G22 Spec. Sheet (\*pdf)
- Alloy C276 Spec. Sheet (\*pdf, 118 KB )
- Alloy 400 Spec. Sheet (\*pdf)
- Alloy F255 Spec. Sheet (\*pdf)
- Nickel 200/201 Spec. Sheet (\*pdf)
- Alloy 686 Spec. Sheet (\*pdf)

Documents marked as (\*pdf) can be viewed with the Free Adobe Acrobat Reader, obtained here : [Get Adobe Acrobat Reader](#)

Titanium  
Corrosion Materials  
Titanium Alloys  
Division

## Material Safety Data Sheets - MSDS

B-3 (R) C-22 (R) G-30 (R)

- Nickel Alloys ( Alloy B2, Alloy B3, Alloy C22, Alloy G30, Alloy 200/201, Alloy 400, Alloy K500, Alloy 600, Alloy 800H/HT, Alloy 686, Alloy 20 ) \*(pdf, 84 KB )
- Stellite \*(pdf, 71 KB )
- Titanium \*(pdf, 68 KB )
- Alloy 255 \*(pdf, 87 KB )
- Alloy 718 \*(pdf, 80 KB )

## General Materials Information

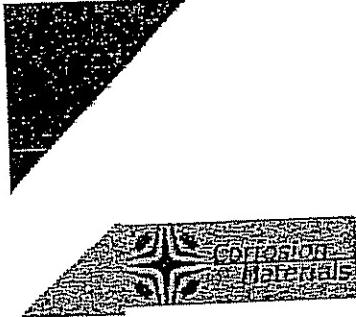
- Alloying Elements (\*pdf, 70kb)
- Austenitic Alloy Hardness Conversion(\*pdf, 41kb)
- Common Trade Names (\*pdf, 104kb)
- Heat Treating of Non-PH Grades(\*pdf, 94kb)
- Machining Nickel Alloys (\*pdf, 71kb)
- Mechanical Properties (\*pdf, 83kb)
- Ni & Ni Alloy Hardness Conversion(\*pdf, 51kb)
- Relative Cost of Alloys (\*pdf, 79kb)

HE 00724

EC 0256

Corrosion Materials - Available Documents

Documents marked as (\*pdf) can be viewed with the Free Adobe Acrobat Reader, obtained here : [Get Acrobat Reader](#)



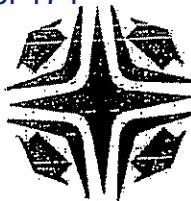
*Products*

*Services*

*Machining*

HE 00725

EC 0257



# CORROSION MATERIALS

ISO 9001-2000 Certified, ISO Registered Since 1993

三

B-30 (2)

**An "X" indicates that the manufacturer does not readily produce the alloy.**  
**Registered trademarks are applicable where indicated by either ® or™ under the corresponding manufacturer.**

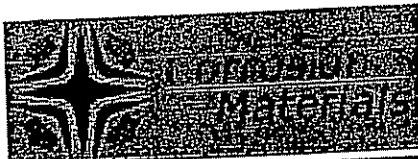
卷之二

C-22

2

1  
C-22 (R)

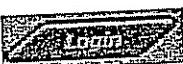
The data and information contained in this pamphlet have been taken from open literature and is believed to be reliable. The information is given summarily or assume any legal liability for its accuracy, completeness or usefulness.



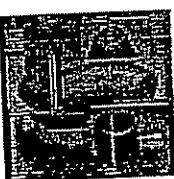
Alloy Quick Select

YOUR CORROSION RESISTANT  
ALLOY SPECIALIST

home  about us  contact  help

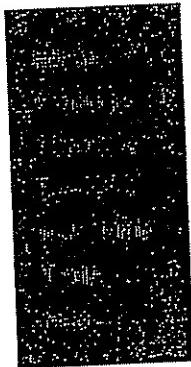


ANY  OR  AND



Alloys

Alloy B2 *B-3* (R)  
Alloy B3 *B-3* (R)  
Alloy C276  
Alloy F255  
Alloy 400 *G-30* (G)  
Alloy G38 *G-30* (G)  
Nickel 200/201  
Alloy 800H/HT  
Alloy K500  
Alloy 600  
Alloy 20  
Alloy 31  
Alloy C22 *C-22* (R)  
Alloy 6B  
Alloy 686



Custom Items

You may specify a custom item by attaching your technical drawing

Product Forms  
Schedule 10  
Buttweld Fittings  
Schedule 40  
Buttweld Fittings  
Schedule 80  
Buttweld Fittings  
150LB Threaded  
Fittings  
3000LB Fittings  
Pipe Plugs And  
Reducing Bushings  
Pipe Nipples  
Pipe  
Fasteners  
Welding Products  
Bar And Rod  
Sheet And Plate  
Tubing  
Tube Fittings  
Flanges  
Half Bushings and  
Sleeves  
6000LB Fittings  
Misc. Items

Catalog Help  
Need help in choosing the right alloy or product for your application? We can Help

Titanium  
Corrosion Materials  
Titanium Alloys  
Division

Titanium Alloys :  
Grade 1  
Grade 2  
Grade 3  
Grade 4  
Grade 5  
Grade 5 ELI  
Grade 7

*B-3, G-30 and C-22 are registered trademarks of Haynes International, Inc.*

**Tip:** If you would like to construct an RFQ, browse the product catalog and assemble the items you want quoted into a shopping cart. Then, simply submit the shopping cart to be quoted.

Products

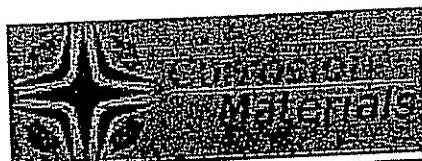
Services

Machining

HE 00727

EC 0308

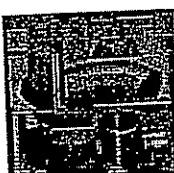
3/10/2005



Alloy Quick Select



© ANY C OR C AND  
SEARCH



C-22<sup>®</sup>  
Alloy 622

### Documentation :

Material Data Safety Sheet (PDF Format)

Specifications Sheet (PDF Format)

### Description:

Alloy C-22/UNS NO6022 is a nickel-chromium-molybdenum alloy with enhanced resistance to pitting, crevice corrosion and stress corrosion cracking. It resists the formation of grain boundary precipitates in the weld-heat affected zone making it suitable for use in the as-welded condition. C-22/UNS NO6022 has outstanding resistance to both reducing and oxidizing media and because of its resistibility can be used where "upset" conditions are likely to occur. It is proven to possess excellent weldability and high corrosion resistance as consumable filler wires and electrodes. The alloy has proven results as a filler wire in many applications. As filler wire use when other corrosion resistant wires have failed.

C-22/UNS NO6022 can easily be cold-worked because of its ductility and cold-forming is the preferred method of forming. More energy is required because the alloy is generally stiffer than austenitic stainless steels. 0.28" thick sheet in the heat-treated at 2050°F, rapid quenched condition, has an average Olsen cup depth of 0.49".

### Products From This Alloy:

Schedule 10 Butt-weld Fittings



Schedule 40 Butt-weld Fittings



3000LB Fittings



Pipe Plugs And Reducing Bushings



Pipe



Fasteners



Welding Products



Bar And Rod



Sheet And Plate



Tubing



Tube Fittings



### Chemical Composition :

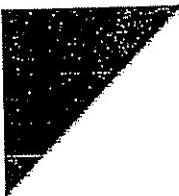
Element	Avg. Nominal %
Nickel	Balance
Chromium	22.0
Molybdenum	13.5
Tungsten	3.0

HE 00728

EC 0309

Iron	4.0
Carbon	0.015 Max
Silicon	0.08 Max

C-22 is a registered trademark of Haynes International, Inc.



*Products*

*Services*

*Machining*

HE 00729

EC 0310

Haynes' C-22

**Alstadt, Lynn**

**From:** Campbell, Ron [RCampbell@CorrosionMaterials.com]  
**Sent:** Monday, September 12, 2005 5:44 PM  
**To:** Alstadt, Lynn  
**Subject:** RE: Haynes' C-22

I can handle the CML also. thank you

**From:** Alstadt, Lynn [mailto:alstadtj@bipc.com]  
**Sent:** Monday, September 12, 2005 4:38 PM  
**To:** Campbell, Ron  
**Cc:** Paul Manning  
**Subject:** RE: Haynes' C-22

Mr Campbell,

Thank you for your prompt attention to our request. I will look forward to seeing the corrected web pages.

There are similar problems with the web pages of your UK affiliate CML Alloys. I will fax you those pages with a request that you ask CML Alloys to make the requested changes. If you would prefer that I contact CML Alloys directly please provide the name, address and fax number of the person that I should contact

Lynn J Alstadt

**From:** Campbell, Ron [mailto:RCampbell@CorrosionMaterials.com]  
**Sent:** Monday, September 12, 2005 5:18 PM  
**To:** Alstadt, Lynn  
**Subject:** Haynes' C-22

Dear Mr. Alstadt,

We have reviewed the fax. Oddly, the brochure for C-22 you sent was changed long ago to Alloy C22 vs. Alloy C-22. We thought that change sufficient. If you access our web you will see what I mean. In any event, we realize that C-22 v. C22 is splitting hairs and we will change our materials to indicate Alloy 22 in the next few days. The other areas where we have left of the trademark will be fixed also. Would you be so kind as to acknowledge receipt of this email. Thank you.

Ron Campbell  
Corrosion Materials  
225-775-3675  
225-778-4664 fax  
<http://www.corrosionmaterials.com>

HE 00730

TAX ADVICE DISCLAIMER: Any federal tax advice contained in this communication (including attachments) was not intended or written to be used, and it cannot be used, by you for the purpose of (1)

Haynes' C-22

avoiding any penalty that may be imposed by the Internal Revenue Service or (2) promoting, marketing or recommending to another party any transaction or matter addressed herein. If you would like such advice, please contact us.

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If you are not the intended recipient, please advise the sender immediately.

Unauthorized use or distribution is prohibited and may be unlawful.

**Buchanan Ingersoll PC**

ATTORNEYS

Lynn J. Alstadt  
 412 562 1632  
 alstadtlj@bipc.com

One Oxford Centre  
 301 Grant Street, 20th Floor  
 Pittsburgh, PA 15219-1410  
 T 412 562 8800  
 F 412 562 1041  
 www.buchananingersoll.com

September 13, 2005

**VIA FACSIMILE AND FIRST CLASS MAIL**

Mr. Ron Campbell  
 Corrosion Materials  
 2262 Groom Road  
 Post Office Box 666  
 Baker, LA 70714

Re: Use of Haynes Trademarks

Dear Mr. Campbell:

In my letter to you of Friday, September 9, I neglected to include the web pages of your European affiliate, CML Alloys, in which Haynes' trademarks appear, but are not identified as Haynes' trademarks.

While CML Alloys may use Haynes' trademarks in conjunction with the sale of products that you purchase from Haynes, any use of Haynes' trademarks must indicate that the trademarks being used are trademarks of Haynes International, Inc. Consequently, on each of the enclosed pages I have identified the Haynes' trademarks and noted an ® next to each mark. In those instances where the trademark is used in a sentence as a noun rather than an adjective I have inserted the correct noun.

Continued use of the enclosed web pages without the noted changes constitutes misuse of Haynes' trademarks. Please instruct CML Alloys to correct or discontinue the use of the attached web pages.

Please tell me by September 30, 2005, whether CML Alloys will change or discontinue using the enclosed web pages and if so, when the new corrected pages will be in use.

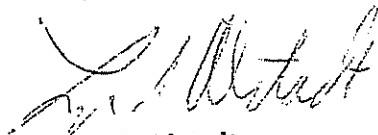
HE 00732

September 13, 2005

Page - 2 -

If you have any questions or concerns, please call me.

Very truly yours,



Lynn J. Alstadt

LJA/bem

Enclosures

cc: Paul Manning (w/encl.)

HE 00733

# CML Alloys

## Your Nickel Alloy Specialist

### C-22 Technical Data Product List

## Hastelloy® Alloy C-22<sup>®</sup>

Hastelloy® Alloy C-22 is a nickel-chromium-molybdenum alloy with enhanced resistance to pitting, crevice corrosion and stress corrosion cracking. It resists the formation of grain boundary precipitates in the weld-heat affected zone making it suitable for use in the as-welded condition. C-22 has outstanding resistance to both reducing and oxidizing media and because of its resistibility can be used where "upset" conditions are likely to occur. It is proven to possess excellent weldability and high corrosion resistance as consumable filler wires and electrodes. The alloy has proven results as a filler wire in many applications. As filler wire use when other corrosion resistant wires have failed.

C-22 can easily be cold-worked because of its ductility and cold-forming is the preferred method of forming. More energy is required because the alloy is generally stiffer than austenitic stainless steels. 0.28" thick sheet in the heat-treated at 2050°F, rapid quenched condition, has an average olsen cup depth of 0.49".

### C-22 Technical Data

#### Nominal Chemical Composition By Percent

Element	Average Nominal % of Elements
Nickel	Balance
Chromium	22.0
Molybdenum	13.5
Tungsten	3.0
Iron	4.0
Carbon	0.015 Max
Silicon	0.08 Max

Hastelloy and C-22 are registered trademarks  
of Haynes International, Inc.

HE 00734

EC 0292

Product Index

# Hastelloy® Alloy C-22

## Average Tensile Data, Solution Heat-Treated

Form	Test Temp °F(°C)	Ultimate Tensile Strength* Ksi	Yield Strength 0.2% Offset* Ksi	Elongation in 2" (50.8mm) %
Sheet, 0.028-0.125" (0.71-3.2mm) thick**	Room	116	59	57
	200(93)	110	54	58
	400(204)	102	44	57
	600(316)	98	42	62
	800(427)	95	41	67
	1000(538)	91	40	61
	1200(649)	95	36	65
	1400(760)	76	35	63
Plate, 1/4-3/4" (6.4-19.1mm) thick***	Room	114	54	62
	200(93)	107	49	65
	400(204)	98	41	66
	600(316)	95	36	68
	800(427)	92	35	68
	1000(538)	88	34	67
	1200(649)	85	32	69
	1400(760)	76	31	68
Bar, 1/2-2" (12.7-50.8mm) diameter****	Room	111	52	70
	200(93)	105	45	73
	400(204)	96	38	74
	600(316)	92	34	79
	800(427)	89	31	79
	1000(538)	84	29	80
	1200(649)	80	28	80
	1400(760)	72	29	77

\*Ksi can be converted to MPa (megapascals) by multiplying by 6.895.

\*\*Average of 10-20 tests.

\*\*\*Average of 16-32 tests.

\*\*\*\*Average of 8-16 tests.

Hastelloy and C-22 are registered trademarks of Haynes International, Inc.

Note: Data shown are typical. Full research should be done to determine the usefulness in any particular design or application. No warranty is expressed or implied and we assume no responsibility for the accuracy, completeness, or usefulness of the contents.

HE 00735

EC 0293

# CML Alloys

## Your Nickel Alloy Specialist

[Home](#) | [Product List](#) | [Contacts](#) | [Quotes](#)

Products Listed by Alloy and Form:

### Hastelloy C-22

- Sheet
- Plate
- Bar
- Pipe
- Fasteners
- Fittings
- Tube
- Tube Fittings

### Hastelloy Alloy C-276

- Sheet
- Plate
- Bar
- Pipe
- Fasteners
- Fittings
- Tube
- Tube Fittings

### Nickel-Copper Alloy CM-400

- Sheet
- Plate
- Bar
- Pipe
- Fittings
- Tube

---

### Nickel-Chromium-Molybdenum Alloy 20

- Bar

### Alloy 825

- Sheet
- Plate
- Bar
- Pipe
- Fittings
- Flanges

HE 00736

Other Corrosion-Resistant and High-Performance Alloys Available:

EC 0290

- B-2
- B-3<sup>®</sup>
- G-30<sup>®</sup>
- F-255
- CM 200/201
- CM-600
- CM-800
- K500
- 718-OP
- Stellite 6-B
- Inconel 686
- Titanium, Grade 1
- Titanium, Grade 2
- Titanium, Grade 3
- Titanium, Grade 4
- Titanium, Grade 5
- Titanium, Grade 7

Contact the CML Alloys Sales Staff for more information

*Ifastellix, C-22, B-3 and G-30 are registered trademarks of Haynes International, Inc.*

HE 00737

EC 0291

**Alstadt, Lynn**

---

**From:** Campbell, Ron [RCampbell@CorrosionMaterials.com]  
**Sent:** Wednesday, September 21, 2005 10:04 AM  
**To:** Alstadt, Lynn  
**Subject:** RE: Haynes' C-22

we are going to have to adjust some printed matter to reflect alloy 22 thank you.

---

**From:** Alstadt, Lynn [mailto:alstadtj@bipc.com]  
**Sent:** Wednesday, September 21, 2005 9:02 AM  
**To:** Campbell, Ron  
**Cc:** Paul Manning  
**Subject:** RE: Haynes' C-22

Mr. Campbell,

C22 should not be used. Haynes trademark is C-22, the letter C and the number 22 separated by a dash. To use C22 without the dash where the intent is to identify a product that originated from Haynes, that is to use C22 in place of C-22, would be a mutilation of the registered trademark and should not be done.

One should also not use C22 to identify an alloy not made by or supplied by Haynes. C22 is so close to C-22, that the use of C22 in connection with an alloy that was not made by Haynes would constitute an infringement of the registered trademark C-22.

Some manufactures have called their alloy that is within UNS N06022 "alloy 22." Haynes has no objection to use of "alloy 22."

Thank you for making the requested changes to your website and for requesting that similar changes be made by CML Alloys. I just checked your website and found it to be unavailable. I will check it again and also check the CML Alloys website in a few days.

Your e-mail did not mention any brochures or other paper documents that may contain Haynes' trademarks. Please confirm that you have corrected or discontinued the use of any such materials that improperly use a Haynes' trademark.

We appreciate your cooperation.

Lynn J. Alstadt

---

**From:** Campbell, Ron [mailto:RCampbell@CorrosionMaterials.com]  
**Sent:** Wednesday, September 21, 2005 9:37 AM  
**To:** Alstadt, Lynn  
**Subject:** RE: Haynes' C-22

Mr. Alstadt, an update and a question, if you please. The web pages should be changed today. Our web guy lost his house and evacuated to Houston so he's been a little unavailable. I have also sent the CML Alloys changes to him, but these won't happen for a couple of days. That is, unless he gets hit by another hurricane, which would seem to be likely. In any event, we are working on it.

With regard to C-22, do you, or Haynes' feel that C22, without the dash, is offensive? We are removing it from the web in any event, but I was curious as to if this was still considered infringement. Thank you.

Ron Campbell

---

**From:** Alstadt, Lynn [mailto:[alstadtlj@bipc.com](mailto:alstadtlj@bipc.com)]  
**Sent:** Monday, September 12, 2005 4:38 PM  
**To:** Campbell, Ron  
**Cc:** Paul Manning  
**Subject:** RE: Haynes' C-22

Mr Campbell,

Thank you for your prompt attention to our request I will look forward to seeing the corrected web pages

There are similar problems with the web pages of your UK affiliate CML Alloys I will fax you those pages with a request that you ask CML Alloys to make the requested changes. If you would prefer that I contact CML Alloys directly please provide the name, address and fax number of the person that I should contact.

Lynn J. Alstadt

---

**From:** Campbell, Ron [mailto:[RCampbell@CorrosionMaterials.com](mailto:RCampbell@CorrosionMaterials.com)]  
**Sent:** Monday, September 12, 2005 5:18 PM  
**To:** Alstadt, Lynn  
**Subject:** Haynes' C-22

Dear Mr. Alstadt,

We have reviewed the fax. Oddly, the brochure for C-22 you sent was changed long ago to Alloy C22 vs. Alloy C-22. We thought that change sufficient. If you access our web you will see what I mean. In any event, we realize that C-22 v. C22 is splitting hairs and we will change our materials to indicate Alloy 22 in the next few days. The other areas where we have left of the trademark will be fixed also. Would you be so kind as to acknowledge receipt of this email. Thank you.

Ron Campbell  
Corrosion Materials  
225-775-3675  
225-778-4664 fax  
<http://www.corrosionmaterials.com>

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HE 00739

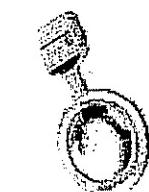
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HE 00740



# FastAlloys

FastAlloys Profile	Strip & Coil	Sheet & Laser Cutting	Plate	Special Arrangements	Quality Accreditation	Spiral Gasket Manufacturing Industry	Bursting Disc Manufacturing Industry
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Contact Details

## Plate Stock Range

316L  
304  
304L  
321  
316Ti  
31803  
32760  
254 SMO  
904L  
347  
ALLOY 20  
ALLOY 200  
ALLOY 400  
ALLOY 600  
ALLOY 625  
ALLOY 800  
ALLOY 825  
ALLOY C22®  
ALLOY 17-4 PH  
ALLOY 17-7 pH  
ALLOY C276  
ALLOY X750  
ALLOY B3®  
TITANIUM GRADE 2  
TITANIUM GRADE 7

Thickness Range: 4mm up to 50mm  
other thicknesses available on request.

Size Range: 2000mm x 1000mm up to 6000mm x 2000mm

We also have a wide range of extremely competitive priced offcuts,  
details on request.

Full size or shape cutting service available.

HE 00741

*"C-22 & B-3 are registered trademarks of Haynes International Inc."*

HE 00742



# FastAlloys Stainless Steel, Super Alloy Stock & Services

FastAlloys Profile	Strip & Coil	Sheet & Laser Cutting	Plate	Special Arrangements	Quality Accreditation	Spiral Gasket Manufacturing Industry	Bursting Disc Manufacturing Industry
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Contact Details

## Strip & Coil

### **Stainless Strip**

#### AISI

301

302

304

304L

305

309

310

316L

317L

316Ti

321

347

#### UNS

31803 (Duplex)

254 SMO

*Available in Cold Rolled,  
Bright Annealed & Temper  
Rolled.*

#### Coil Dimension Range

Width: up to 1200mm

Thickness: 0.01mm to 1.5mm

Slitting Capability

Width: 2.5mm to 1000mm

Thickness: 0.01mm to 1.5mm

*Slit Strip is available in  
Pancakes, Coils or Oscillate  
Wound onto Plastic Spools.*

### **Super Alloy Strip**

#### ALLOY

20

17-7PH

904L

200

201

400

600

625

718

800

800HT

825

C276

B-3®

X750

C-22®

Titanium Grade 1

Titanium Grade 2

Titanium Grade 7

*"C-22 & B-3 are registered  
trademarks of Haynes  
International Inc."*

**Buchanan Ingersoll PC**

ATTORNEYS

Lynn J. Alstadt  
412 562 1632  
alstadtlj@bipc.com

One Oxford Centre  
301 Grant Street, 20th Floor  
Pittsburgh, PA 15219-1410  
T 412 562 8800  
F 412 562 1041  
[www.buchananingersoll.com](http://www.buchananingersoll.com)

September 13, 2005

**VIA COURIER**

Tom Snead, President  
Fisher-Rosemount Systems, Inc.  
8301 Cameron Road  
Austin, TX 78754-3895

**Re: Use of Haynes Trademarks**

Dear Mr. Snead:

We represent Haynes International, Inc. As you may know, Haynes has several registered trademarks for the metal alloys that Haynes produces. The marks are listed on the enclosed report from the United States Patent and Trademark Office.

It has come to our attention that Don Bush, a Senior Engineering, at Fisher Controls wrote a paper titled Standardizing Metallic Material Designations which is available as technical monograph 35 on the Fisher Regulators website, <http://www.fisherregulators.com/technical-monograph/35/>. A copy of that paper is enclosed.

Pages 5 through 17 contain tables listing various alloys using a variety of designations including trademarks. On page 17 the author identifies the owners of many of the trademarks listed in his table. While the HAYNES and HASTELLOY trademarks are identified as being owned by Haynes International, Inc., two other Hayes registered trademarks, C-22 and G-30, appear in the tables, but are not so identified. In addition, these marks are incorrectly used without a dash between the letter and number.

I have noted in red on the enclosed paper each instance where C-22 and G-30 are improperly used by showing the correct use of these trademarks.

In view of the fact that this paper is being distributed over the internet and may be available elsewhere. We ask that you immediately make the corrections described below and noted in red on the enclosed copy.

The ® designation should appear as a superscript adjacent to the end of each trademark. This designation should be used everywhere the registered mark appears. It would also be acceptable for these trademarks to be identified by footnote as the author has done for the HAYNES and HASTELLOY marks. There should also be a line added that says: "C-22 and G-30 are registered trademarks of Haynes International, Inc."

HE 00744

September 13, 2005

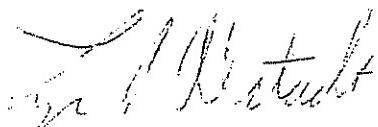
Page - 2 -

Continued dissemination of this paper in which the Haynes trademarks appear without being identified as such constitutes misuse of Haynes trademarks. If such misuse continues Haynes may be required to take legal action against your company to stop the misuse or lose valuable trademark rights.

Please tell me by September 30, 2005, whether you will change the paper as noted on the enclosed copy or remove it from the website and cease all distribution.

If you have any questions or concerns, please call me.

Very truly yours,



Lynn J. Alstadt

LJA/bem

Enclosures

cc: Paul Manning (w/encl.)

HE 00745



United States Patent and Trademark Office

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## Trademarks > Trademark Electronic Search System(Tess)

TESS was last updated on Sat Sep 10 04:12:50 EDT 2005



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List  
At:

OR  to  
record:

**23 Records(s) found (This page: 1 ~ 23)**

(Haynes)[ON] and (International)[ON] not (S)

Current Search: S4: (Haynes)[ON] and (International)[ON] not (Seasol)[ON] and (live)[LD] docs: 23 occ: 71

Serial Number	Reg. Number	Word Mark	Check Status	Live/Dead	
1	76442604	2816268	556	TARR	LIVE
2	76434700		2B2	TARR	LIVE
3	76423154	2785667	D-205	TARR	LIVE
4	76423153	2755568	230-W	TARR	LIVE
5	76423152	2752325	214	TARR	LIVE
6	76423151	2752324	242	TARR	LIVE
7	76400933	2832716	G-35	TARR	LIVE
8	76400932		C-22HS	TARR	LIVE
9	75646170	2532561	625SQ	TARR	LIVE
10	75047108	2023945	HR-120	TARR	LIVE
11	74697077	1982521	230	TARR	LIVE
12	74697076	2002631	C-2000	TARR	LIVE
13	74673214	2063855	B-3	TARR	LIVE
14	74174760	1717465	HR-160	TARR	LIVE
15	74168140	1711142	G-50	TARR	LIVE
16	74023771	1742719	ULTIMET	TARR	LIVE
17	73701791	1600332	G-30	TARR	LIVE
18	73701790	1953864	C-22	TARR	LIVE
19	72159440	0759676	MULTIMET	TARR	LIVE
20	72157340	0756690	MULTIMET	TARR	LIVE
21	71667590	0605011	HASTELLOY	TARR	LIVE
22	71586534	0566221	HAYNES	TARR	LIVE
23	71292933	0269898	HASTELLOY	TARR	LIVE

HE 00746

# technical monograph **35**

## **Standardizing Metallic Material Designations**

**Don Bush**

Senior Engineer  
Materials Research and Testing  
Fisher Controls International, Inc.

HE 00747



FISHER-ROSEMOUNT™

# Standardizing Metallic Material Designations

The wide range of chemicals, temperatures, and pressures found in today's industrial processing systems requires equipment made of a similarly wide variety of metallic materials. Over the years, these materials have been given many designations, including popular trade-names, American Iron and Steel Institute (AISI) designations, American Society for Testing and Materials (ASTM) designations, plus others.

As might be expected, there has been little agreement among the organizations on how to name materials, with the unfortunate result being a great deal of confusion between equipment specifiers and manufacturers on which material designations to utilize.

To help alleviate this problem, a number of technical societies and trade associations have recently collaborated on efforts to standardize alloy designations. The following describes two of the more widely-used systems.

## Unified Numbering System (UNS)

The most widely accepted designation system is the Unified Numbering System developed jointly by the Society of Automotive Engineers (SAE) and ASTM. This system provides a uniform method of designating metallic materials by dividing metals and alloys into 18 series.

Within each series the material designation starts with a single alpha character, which in many cases is suggestive of the family of metals it identifies (e.g., "A" for aluminum alloys, "C" for copper alloys, "N" for nickel alloys, "S" for stainless steels).

Following the alpha character are five numeric digits, which likewise often suggest alloys within the family of metals (e.g., A92024 for 2024 aluminum, C36000 for copper alloy 360, S31600 for type 316 stainless steel, N04400 for nickel alloy 400, N10276 for nickel alloy C276, G10180 for 1018 steel).

The publication "Metals and Alloys in the Unified Numbering System" gives a complete listing of all UNS numbers assigned to date. In addition, it provides a cross-reference for UNS numbers, UNS material descriptions, tradenames, compositions, and specifications. It can be obtained from the Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.

*Prefixes Used within UNS Numbering System*

UNS Prefix	Alloy Series
A	Aluminum and aluminum alloys
C	Copper and copper alloys
D	Steel with specified mechanical properties
E	Rare earths and rare earth-like metals and alloys
F	Cast irons
G	AISI and SAE carbon steels and alloys (except H-steels and tool steels)
H	AISI H-steels (hardenability controlled)
J	Cast steels (except tool steels)
K	Miscellaneous steels and ferrous alloys
L	Low melting metals and alloys
M	Miscellaneous non-ferrous metal and alloys
N	Nickel and nickel alloys
P	Precious metals and alloys
R	Reactive and refractory metals and alloys
S	Heat and corrosion resistant (stainless) steels
T	Tool steels
W	Welding filler materials classified by weld deposit composition
Z	Zinc and zinc alloys

## ACI Designations

A former division of the Steel Founders' Society called the Alloy Casting Institute (ACI) developed a system for designating stainless and heat resisting casting alloys.

Casting designations per this system begin with either a "C" (for corrosion resistant materials) or an "H" (for heat resistant materials).

The second letter in the designation ranges from "A" to "Z" depending upon the nickel and, to a lesser degree, the chromium content. For example, a corrosion resistant material with no nickel and 12% chromium begins with "CA" (example, CA15), while an alloy with 100% nickel and no chromium begins with "CZ" (example, CZ100).

Following the letter designators are numeric digits which indicate the maximum carbon content (percent x 100) of the alloy.

Additional letters following the numeric digits indicate the presence of supplementary alloying elements.

Examples of designations and compositions for several materials are listed below for clarification:

ACI Material Designations				
Designation	Chromium	Nickel	Max. Carbon	Other Alloying Elements
CA15	12	---	0.15	---
CD4MCu	25	6	0.04	3.0 Mo, 3.0 Cu
CFBM	19	10	0.08	2.5 Mo
CF3M	19	10	0.03	2.5 Mo
CN7M	21	29	0.07	2.5 Mo
CW2M	16	68	0.02	16 Mo
CZ100	0	100	1.00	---
HK40	25	20	0.40	---

Two groups of materials have designations which do not follow the above scheme. Nickel-copper materials use "M" as the first letter (examples are M35-1 and M25S). Nickel-molybdenum materials utilize "N" as the beginning letter (such as N7M and N12MV).

Although ACI no longer exists, the system has been adopted by ASTM, and designations for new alloys are assigned by the appropriate ASTM committees. UNS numbers have also been assigned to many of these alloys; however, they are less systematic than the ACI designations and are therefore much more difficult to utilize.

## What the Industry is Doing About Standardization

A survey of codes and standards commonly referenced in the process control industry (in particular, ANSI, ASME, and ASTM) indicates that no single designation system is being used for metallic materials. However, a comparison of today's codes and standards with those from several years ago reveals trends indicating the direction being taken with regard to material designations. For the most part, a combination of three designation systems is being used:

- UNS numbers are favored over other systems for nearly all wrought products, including AISI carbon and alloy steels, stainless steels, nickel alloys, copper alloys, aluminum alloys, etc. UNS numbers are favored also for cast aluminum and copper alloys.
- ACI designations are used for all cast stainless and heat resisting steels and cast nickel-base alloys.
- ASTM/ASME designations have been retained for many special carbon and alloy steel products. In addition, cast iron materials have retained their ASTM grade designations.

The fact that UNS numbers have not been adopted within ASTM/ASME codes and standards is likely due to the difficulty in relating UNS numbers with the commonly known ASTM/ASME designations. Several examples follow:

## Examples of Equivalent ASTM/ASME and UNS Designations

ASTM/ASME Designation	UNS Designation
Class C Cast Iron	F12B02
WCB Steel Casting	J03002
LF1 Steel Forging	K03009
A105 or SA105 Steel Forging	K03504
B16 Alloy Steel Boring	K14072

## What Fisher Controls is Doing

Fisher Controls has developed a standard designation system which basically matches current ANSI, ASME, and ASTM codes/standards. In those instances where the Fisher system does not match, Fisher has anticipated which designations will be utilized in future revisions of the codes/standards.

The following describes the Fisher standard alloy designation system for the various families of materials. The Fisher standard designation is italicized in each example. The information which is not italicized is optional.

## Aluminum Alloys

Aluminum alloys are designated with the UNS number. The words "Aluminum Alloy" and the material form are optional.

Examples:

- a. A03800 Aluminum Alloy Die Casting
- b. A92011 Aluminum Alloy Bar

## Copper Alloys

Copper alloys are designated with the UNS number. The UNS material description (listed in "Metals and Alloys in the Unified Numbering System" along with the UNS number) and the material form are optional. The description "Copper Alloy" may be used instead of the specific UNS material description.

Examples:

- a. C11000 Copper Tubing
- b. C36000 Free Cutting Brass Bar
- c. C95400 Aluminum Bronze Casting

## Cast Iron

Cast iron materials are designated by the ASTM or ASME grade. The UNS material description is optional.

Examples:

- a. Class B Gray Cast Iron
- b. SA395 Ductile Cast Iron
- c. Type D-2 Austenitic Ductile Cast Iron
- d. Class 40 Gray Cast Iron

## Carbon Steel

Castings: Carbon steel castings are designated with the ASTM or ASME grade. The words "Carbon Steel Casting" are optional.

**Examples:**

- a. WCB Carbon Steel Casting
- b. LCC Carbon Steel Casting

**Wrought:** The wrought carbon steel forms are designated with the UNS number. In cases where ASTM, ASME and/or SAE use a designation other than the UNS number or the AISI designation, the designation listed in the appropriate specification is used. The words "Carbon Steel" and the form description are optional.

**Examples:**

- a. G10200 Carbon Steel Bar
- b. G10400 Carbon Steel Bar
- c. SA105 Carbon Steel Forging
- d. 2HM Carbon Steel Nuts
- e. Grade 70 Carbon Steel Plate
- f. SAE Grade 5 Carbon Steel Bolting

**Alloy Steel**

**Castings:** Alloy steel castings are designated with the ASTM or ASME grade. The words "Alloy Steel Casting" are optional.

**Examples:**

- a. C5 Alloy Steel Casting
- b. WC6 Alloy Steel Casting

**Wrought:** The wrought alloy steel forms are designated with the UNS number. In cases where ASTM, ASME and/or SAE use a designation other than the UNS number or the AISI designation, the designation listed in the appropriate specification is used. The words "Alloy Steel" and the form description are optional.

**Examples:**

- a. G41400 Alloy Steel Bar
- b. F11 Alloy Steel Forging
- c. B16 Alloy Steel Bolting

**Stainless Steel**

**Castings:** Cast stainless steels (SST) are designated with the ACI grade. The words "SST Casting" are optional.

**Examples:**

- a. CF8M SST Casting
- b. CA6NM SST Casting

**Wrought:** Wrought stainless steels are designated with the UNS number. In cases where ASTM, ASME and/or SAE use a designation other than the UNS number or the AISI designation, the designation listed in the appropriate specification is used. The word "SST" and the material form are optional.

**Examples:**

- a. S31600 SST Bar
- b. S17400 SST Bar
- c. B8M SST Bolting

**Nickel Alloys**

**Castings:** The cast nickel base alloys are designated with the ACI designation. The words "Nickel Alloy Casting" and the generic designation for the wrought equivalent (in parentheses) are optional.

**Examples:**

- a. CW2M Nickel Alloy Casting (Alloy C)
- b. M35-1 Nickel Alloy Casting (Alloy 400)
- c. CN7M Nickel Alloy Casting (Alloy 20)

**Wrought:** The wrought nickel base alloys are designated with the UNS number. The words "Nickel Alloy", the form description, and the generic designation (in parentheses) are optional.

**Examples:**

- a. N10276 Nickel Alloy Bar (Alloy C276)
- b. N07718 Nickel Alloy Bar (Alloy 718)
- c. N05500 Nickel Alloy Tubing (Alloy K500)

**Refractory Metals**

The refractory metals are designated by the UNS number. The base element, form description, and ASTM/ASME grade (in parentheses) are optional.

**Examples:**

- a. R50400 Titanium Alloy Bar (Grade 2)
- b. R56400 Titanium Alloy Casting (Grade C5)
- c. R60702 Zirconium Alloy Bar

**Hardfacing and Weld Overlays**

Hardfacing materials and other weld overlays are identified by their AWS designations. The prefix letter indicating the form of the filler material is omitted (e.g., use CoCr-A, not ECoCr-A or RCoCr-A). The base element and form description are optional.

**Examples:**

- a. CoCr-A Cobalt Alloy Hardfacing
- b. NiCr-C Nickel Alloy Hardfacing
- c. NiMo-7 Nickel Alloy Weld Overlay

**Others**

In cases where the material is available only from a single source, the supplier's tradename may be used if no generic type designation is available. The form description is optional.

Examples:

- a. Wiscalloy M152 Centrifugal Casting
- b. Latrobe BR4FM Bar

## Alloy Cross-Indexes

Tables 1 and 2 each provide a cross-index to the standard designations utilized by Fisher for a large number of commonly used alloys.

Table 1 allows the user to look up a non-standard designation (tradename, common name, other designation) and determine its equivalent Fisher designation.

Table 2 allows the user to look up a Fisher designation and determine other names which might be used for that material.

Table 1. Cross-Reference Sorted by Common/Tradename/Other Designation

Common/Tradename/ Other Designation	Standard Designation	Common/Tradename/ Other Designation	Standard Designation
1, Alloy, Hardfacing	CoCr-C Hardfacing	302 SST	S30200 SST
1-1/4 Cr-1/2 Mo Steel Casting	WC6 Alloy Steel Casting	303 SST	S30300 SST
100B, AISI	G10080 Carbon Steel	303Se SST	S30323 SST
1010, AISI	G10100 Carbon Steel	304 ELC SST	S30403 SST
1018, AISI	G10180 Carbon Steel	304 ELC SST, Cast	CF3 SST Casting
1020, AISI	G10200 Carbon Steel	304 SST	S30400 SST
1030, AISI	G10300 Carbon Steel	304 SST, Bolting	B8 Stainless Steel Bolting
1045, AISI	G10450 Carbon Steel	304 SST, Cast	CF8 SST Casting
1080, AISI	G10800 Carbon Steel	304H SST	S30409 SST
1095, AISI	G10950 Carbon Steel	304L SST	S30403 SST
1100 Aluminum	A91100 Aluminum Alloy Wrought	304L SST, Cast	CF3 SST Casting
12, Alloy, Cast	Alloy 12 Cobalt Alloy Casting	310 SST	S31000 SST
12, Alloy, Hardfacing	CoCr-B Hardfacing Alloy	310 SST, Cast	CK20 SST Casting
120, CDA	C12000 Copper (DLP)	316 ELC SST	S31603 SST
122, CDA	C12200 Copper (DHP)	316 ELC SST, Cast	CF3M SST Casting
12L14 Steel, AISI	G12144 Carbon Steel	316 SST	S31600 SST
13-8 Mo SST	913800 SST	316 SST, Bolting	B8M Stainless Steel Bolting
15-5 PH SST	S15500 SST	316 SST, Cast	CF8M SST Casting
15-5 PH SST, Cast	CB7Cu-2 SST Casting	316H SST	S31609 SST
15-5 SST	S15500 SST	316L SST	S31603 SST
15-5 SST, Cast	CB7Cu-2 SST Casting	316L SST, Cast	CF3M SST Casting
15-7 Mo SST	S15700 SST	317 ELC SST	S31703 SST
17-4 PH SST	S17400 SST	317 ELC SST, Cast	CG3M SST Casting
17-4 PH SST, Cast	CB7Cu-1 SST Casting	317 SST	S31700 SST
17-4 SST	S17400 SST	317 SST, Cast	CG8M SST Casting
17-4 SST, Cast	CB7Cu-1 SST Casting	317L SST	S31703 SST
17-7 PH SST	S17700 SST	317L SST, Cast	CG3M SST Casting
17-7 SST	S17700 SST	319.0, Aluminum Alloy Casting	A03190 Aluminum Alloy Casting
18-2 SST	S18200 SST	321 SST	S32100 SST
2-1/2 Cr-1 Mo Steel Casting	WC9 Alloy Steel Casting	32510 Malleable Iron	S2510 Malleable Iron
20, Alloy (Obsolete)	N08D20 Nickel Alloy	329 SST	S32900 SST
20, Alloy, Cast	CNTM Nickel Alloy Casting	347 SST	S34700 SST
200, Alloy	N02200 Nickel Alloy	347 SST, Cast	CF8C SST Casting
200, Alloy, Cast	CZ100 Nickel Alloy Casting	35018 Malleable Iron	35018 Malleable Iron
201, Alloy	N02201 Nickel Alloy	355.0, Aluminum Alloy Casting	A03550 Aluminum Alloy Casting
2011 Aluminum	A92011 Aluminum Alloy Wrought	356.0, Aluminum Alloy Casting	A03560 Aluminum Alloy Casting
2017 Aluminum	A92017 Aluminum Alloy Wrought	360, CDA Alloy	C36000 Free Cutting Brass
2024 Aluminum	A92024 Aluminum Alloy Wrought	360.0, Aluminum Die Casting	A03600 Aluminum Alloy Die Casting
20B.0, Aluminum Alloy Casting	A02080 Aluminum Alloy Casting	380.0, Aluminum Alloy Die Casting	A03800 Aluminum Alloy Die Casting
20Cb-3, Alloy	N08020 Nickel Alloy	400, Alloy	N04400 Nickel Alloy
21, Alloy	Alloy 21 Cobalt Alloy Casting	400, Alloy, Cast	M35-1 Nickel Alloy Casting
21D, Alloy, Cast (Obsolete)	CZ100 Nickel Alloy Casting	405. Alloy	N04405 Nickel Alloy
22-13-5 SST	S20910 SST	410 Modified, Cast	CA6NM SST Casting
2205 SST	S31B03 SST	410 SST	S41000 SST
22Cr-13Ni-5Mn SST, Carpenter	S20910 SST	410 SST Bolting	B6 Alloy Steel Bolting
25% Chromium White Iron	Class III Type A White Cast Iron	410 SST Modified, Cast	CA6NM SST Casting
25, Alloy	R30605 Co-Cr-Ni-W Alloy	410 SST, Cast	CA15 SST Casting
25, Haynes(1)	R30605 Co-Cr-Ni-W Alloy	410, Alloy, Cast	M35-1 Nickel Alloy Casting
254S5MO SST	S31254 SST	4140. AISI	G41400 Alloy Steel
26-1, E-Brile(2)	S44626 SST	4140. Bolting	B7 Alloy Steel Bolting
29-4C SST	S44735 SST	4140, Bolting (NACE)	B7M Alloy Steel Bolting
3, Alloy, Cast	Alloy 3 Cobalt Alloy Casting	416 SST	S41600 SST
3003 Aluminum	A93003 Aluminum Alloy wrought	418 SST, Cast	Cast Grade 615 SST
301 SST	S30100 SST	420 SST	S42000 SST
301, Nickel Alloy	N03301 Nickel Alloy	422 SST	S42200 SST
		422 SST, Cast	CA28MWV SST Casting

Table 1. Cross-Reference Sorted by Common/Tradename/Other Designation (continued)

Common/Tradename/ Other Designation	Standard Designation	Common/Tradename/ Other Designation	Standard Designation
430 SST	S43000 SST	A03600 Aluminum Alloy Die Casting	A03600 Aluminum Alloy Die Casting
431 SST	S43100 SST	A03800 Aluminum Alloy Die Casting	A03800 Aluminum Alloy Die Casting
4340, AISI	G43400 Alloy Steel	A07120 Aluminum Alloy Casting	A07120 Aluminum Alloy Casting
440A SST	S44002 SST	A07130 Aluminum Alloy Casting	A07130 Aluminum Alloy Casting
440B SST	S44003 SST	A13600 Aluminum Alloy Die Casting	A13600 Aluminum Alloy Die Casting
440C SST	S44004 SST	A13800 Aluminum Alloy Die Casting	A13800 Aluminum Alloy Die Casting
450 SST	S45000 SST	A197 Malleable Cast Iron	A197 Malleable Cast Iron
450, Custom	S45000 SST	A286 SST, Grade	S66286 SST
464, CDA Alloy	C46400 Naval Brass, Uninhibited	A286, Pyromet	S66286 SST
5 Cr-1/2 Mo Steel Casting	C5 Alloy Steel Casting	A360 0, Aluminum Die Casting	A13600 Aluminum Alloy Die Casting
505, Alloy	M25S Nickel Alloy Casting	A380 0, Aluminum Alloy Die Casting	A13800 Aluminum Alloy Die Casting
505, Monel <sup>(3)</sup>	M25S Nickel Alloy Casting	A47120 Aluminum Alloy Casting	A47120 Aluminum Alloy Casting
5052 Aluminum	A95052 Aluminum Alloy Wrought	A91100 Aluminum Alloy Wrought	A91100 Aluminum Alloy Wrought
506, Alloy, Cast	M35H Nickel Alloy Casting	A92011 Aluminum Alloy Wrought	A92011 Aluminum Alloy Wrought
506, Monel, Cast	M35H Nickel Alloy Casting	A92017 Aluminum Alloy Wrought	A92017 Aluminum Alloy Wrought
5150H, AISI	H51500 Alloy Steel	A92024 Aluminum Alloy Wrought	A92024 Aluminum Alloy Wrought
5160H, AISI	H51600 Alloy Steel	A93003 Aluminum Alloy Wrought	A93003 Aluminum Alloy Wrought
6, Alloy, Cast	R30006 Cobalt Alloy Casting	A95052 Aluminum Alloy Wrought	A95052 Aluminum Alloy Wrought
6, Alloy, Hardfacing	CoCr-A Hardfacing Alloy	A96051 Aluminum Alloy Wrought	A96051 Aluminum Alloy Wrought
6, Alloy, Wrought	Alloy 6B Cobalt Alloy	A96053 Aluminum Alloy Wrought	A96053 Aluminum Alloy Wrought
60-40-18 Ductile Cast Iron	60-40-18 Ductile Cast Iron	A97075 Aluminum Alloy Wrought	A97075 Aluminum Alloy Wrought
600, Alloy	N06600 Nickel Alloy	AG40A, Zinc Alloy Die Casting	Z33520 Zinc Die Casting
600, Alloy, Cast	CY40 Nickel Alloy Casting	AG41A, Zinc Alloy Die Casting	Z35531 Zinc Die Casting
600, Pyromet <sup>(4)</sup>	N06600 Nickel Alloy	Alloy 12, Cast	Alloy 12 Cobalt Alloy Casting
6061 Aluminum	A96051 Aluminum Alloy Wrought	Alloy 12, Cobalt Alloy Casting	Alloy 12 Cobalt Alloy Casting
6063 Aluminum	A96063 Aluminum Alloy Wrought	Alloy 12, Hardfacing	CoCr-B Hardfacing Alloy
610, Alloy, Cast (Obsolete)	CY40 Nickel Alloy Casting	Alloy 20	N08020 Nickel Alloy
614, CDA Alloy	C61400 Aluminum Bronze D	Alloy 20 (Obsolete)	N08020 Nickel Alloy
615 SST	S41800 SST	Alloy 20, Cast	CN7M Nickel Alloy Casting
616 SST	S42200 SST	Alloy 200	N02200 Nickel Alloy
625, Alloy	N06625 Nickel Alloy	Alloy 200, Cast	CZ100 Nickel Alloy Casting
625, Alloy, Cast	CW6MC Nickel Alloy Casting	Alloy 201	N02201 Nickel Alloy
625, Pyromet	N06625 Nickel Alloy	Alloy 20Cb-3	N08020 Nickel Alloy
630, Custom	S17400 SST	Alloy 21	Alloy 21 Cobalt Alloy Casting
636, Carpenter	S42200 SST	Alloy 21, Cobalt Alloy Casting	Alloy 21 Cobalt Alloy Casting
65-45-12 Ductile Cast Iron	65-45-12 Ductile Cast Iron	Alloy 210, Cast (Obsolete)	CZ100 Nickel Alloy Casting
660 SST, Grade	S66286 SST	Alloy 25	R30605 Co-Cr-Ni-W Alloy
661, CDA Alloy	C66100 Silicon Bronze	Alloy 255 SST	S32550 SST
670, AISI	R30605 Co-Cr-Ni-W Alloy	Alloy 3, Cast	Alloy 3 Cobalt Alloy Casting
680, Grade	N06002 Nickel Alloy	Alloy 3, Cobalt Alloy Casting	Alloy 3 Cobalt Alloy Casting
7 Mo Plus <sup>(5)</sup> SST	S32950 SST	Alloy 301	N03301 Nickel Alloy
706, Alloy	N09706 Nickel Alloy	Alloy 400	N04400 Nickel Alloy
7075 Aluminum	A97075 Aluminum Alloy Wrought	Alloy 400, Cast	M35-1 Nickel Alloy Casting
712.0, Aluminum Alloy Casting	07120 Aluminum Alloy Casting	Alloy 405	N04405 Nickel Alloy
713.0, Aluminum Alloy Casting	47120 Aluminum Alloy Casting	Alloy 410, Cast (Nickel Alloy)	M35-1 Nickel Alloy Casting
718, Alloy	N07718 Nickel Alloy	Alloy 411, Cast	M30C Nickel Alloy Casting
718, Pyromet	N07718 Nickel Alloy	Alloy 505	M25S Nickel Alloy Casting
80-55-06 Ductile Cast Iron	80-55-06 Ductile Cast Iron	Alloy 505, Cast	M35H Nickel Alloy Casting
800, Alloy	N08800 Nickel Alloy	Alloy 6, Cast	R30006 Cobalt Alloy Casting
800, Alloy, Cast	Cast Alloy 800	Alloy 6, Hardfacing	CoCr-A Hardfacing Alloy
825, Alloy	N08825 Nickel Alloy	Alloy 6, Wrought	Alloy 6B Cobalt Alloy
825, Alloy, Cast	Cast Alloy 825	Alloy 600	N06600 Nickel Alloy
836, CDA Cast Alloy	C83600 Cast Leaded Red Brass	Alloy 600, Cast	CY40 Nickel Alloy Casting
865, CDA Alloy, Cast	C86500 Cast Manganese Bronze	Alloy 610, Cast (Obsolete)	CY40 Nickel Alloy Casting
865, CDA Cast Alloy	C86500 Cast Manganese Bronze	Alloy 625	N06625 Nickel Alloy
BS Nuts	S21800 SST	Alloy 625, Cast	CW6MC Nickel Alloy Casting
9 Cr-1 Mo Steel Casting	C12 Alloy Steel Casting	Alloy 6B, Cobalt Alloy	Alloy 6B Cobalt Alloy
905, CDA Alloy, Cast	C90500 Cast Tin Bronze	Alloy 706	N09706 Nickel Alloy
908, CDA Alloy, Cast	C90800 Cast Tin Bronze	Alloy 718	N07718 Nickel Alloy
922, CDA Alloy, Cast	C92200 Cast Leaded Tin Bronze	Alloy 800	N08800 Nickel Alloy
925, Alloy	N09925 Nickel Alloy	Alloy 800, Cast	Cast Alloy 800
925, Alloy, Cast	Cast Alloy 925	Alloy 825	N08825 Nickel Alloy
954, CDA Cast Alloy	C95400 Cast Aluminum Bronze	Alloy 825, Cast	Cast Alloy 825
955, CDA Cast Alloy	C95500 Cast Aluminum Bronze	Alloy 925	N09925 Nickel Alloy
964, CDA Alloy, Cast	C96400 Cast Copper Nickel	Alloy 925, Cast	Cast Alloy 925
A02080 Aluminum Alloy Casting	A02080 Aluminum Alloy Casting		
A03190 Aluminum Alloy Casting	A03190 Aluminum Alloy Casting		
A03550 Aluminum Alloy Casting	A03550 Aluminum Alloy Casting		
A03560 Aluminum Alloy Casting	A03560 Aluminum Alloy Casting		

Table 1. Cross-Reference Sorted by Common/Tradename/Other Designation (continued)

Common/Tradename/ Other Designation	Standard Designation	Common/Tradename/ Other Designation	Standard Designation
Alloy B (Obsolete)	N10D01 Nickel Alloy	C276, Alloy	N10276 Nickel Alloy
Alloy B, Cast (Obsolete)	N12MV Nickel Alloy Casting	C36000 Free Cutting Brass	C36000 Free Cutting Brass
Alloy B2	N10665 Nickel Alloy	C4, Alloy	N06455 Nickel Alloy
Alloy B2, Cast	N7M Nickel Alloy Casting	C4, Alloy, Cast	CW2M Nickel Alloy Casting
Alloy C, Cast (Obsolete)	CW12M-1 Nickel Alloy Casting	C46400 Naval Brass, Uninhibited	C46400 Naval Brass, Uninhibited
Alloy C, Cast (Obsolete)	CW12MW Nickel Alloy Casting	C4C, Alloy, Cast	CW2M Nickel Alloy Casting
Alloy C22 <i>(C-22)</i>	N06022 Nickel Alloy	C5 Alloy Steel Casting	C5 Alloy Steel Casting
Alloy C22, Cast	Cast Alloy C22 <i>(C-22)</i>	C5, Wrought	S50200 SST
Alloy C276	N10276 Nickel Alloy	C61400 Aluminum Bronze D	C61400 Aluminum Bronze
Alloy C4	N06455 Nickel Alloy	C66100 Silicon Bronze	C66100 Silicon Bronze
Alloy C4, Cast	CW2M Nickel Alloy Casting	C83600 Cast Leaded Red Brass	C83600 Cast Leaded Red Brass
Alloy C4C, Cast	CW2M Nickel Alloy Casting	C86500 Cast Manganese Bronze	C86500 Cast Manganese Bronze
Alloy D, Cast Nickel-Silicon Alloy	Alloy D Cast Nickel-Silicon Alloy	C90500 Cast Tin Bronze	C90500 Cast Tin Bronze
Alloy G (Obsolete)	N06007 Nickel Alloy	C90800 Cast Tin Bronze	C90800 Cast Tin Bronze
Alloy G2	N06975 Nickel Alloy	C92200 Cast Leaded Tin Bronze	92200 Cast Leaded Tin Bronze
Alloy G3	N06985 Nickel Alloy	C95400 Cast Aluminum Bronze	95400 Cast Aluminum Bronze
Alloy G3 <i>(G-30)</i>	N06030 Nickel Alloy	C95500 Cast Aluminum Bronze	C95500 Cast Aluminum Bronze
Alloy K500	N05500 Nickel Alloy	C96400 Cast Copper Nickel	C96400 Cast Copper Nickel
Alloy N	N10003 Nickel Alloy	CA15 SST Casting	CA15 SST Casting
Alloy R405	N04405 Nickel Alloy	CA2BMW SST Casting	CA2BMW SST Casting
Alloy S, Cast	M25S Nickel Alloy Casting	CA6NM SST Casting	CA6NM SST Casting
Alloy X	N06002 Nickel Alloy	Carbon-Moly Steel	WC1 Alloy Steel Casting
Alloy X750	N07750 Nickel Alloy	Carpenter 20 (Obsolete)	N08020 Nickel Alloy
ASME SA193 Grade B6	B6 Alloy Steel Bolting	Carpenter 2DCb-3	N08020 Nickel Alloy
ASME SA193 Grade B7	B7 Alloy Steel Bolting	Carpenter 7 Mo Plus	S32950 SST
ASME SA193 Grade B7M	B7M Alloy Steel Bolting	Cast Alloy 800	Cast Alloy 800
ASME SA193 Grade B8	B8 Stainless Steel Bolting	Cast Alloy 825	Cast Alloy 825
ASME SA193 Grade B8M	B8M Stainless Steel Bolting	Cast Alloy 925	Cast Alloy 925
Avesta 254SMO	S31254 SST	Cast Alloy C22 <i>(C-22)</i>	Cast Alloy C22 <i>(C-22)</i>
B, Alloy (Obsolete)	N10001 Nickel Alloy	Cast Duplex SST	CD4MCu SST Casting
B, Alloy, Cast (Obsolete)	N12MV Nickel Alloy Casting	Cast Duplex SST	CD7MCuN SST Casting
B16 Brass	C36000 Free Cutting Brass	Cast Grade 615 SST	Cast Grade 615 SST
B2, Alloy	N10665 Nickel Alloy	Cast Iron, ASTM A126 Class A	Class A Gray Cast Iron
B2, Alloy, Cast	N7M Nickel Alloy Casting	Cast Iron, ASTM A126 Class B	Class B Gray Cast Iron
B6 Alloy Steel Bolting	B6 Alloy Steel Bolting	Cast Iron, ASTM A126 Class C	Class C Gray Cast Iron
B7 Alloy Steel Bolting	B7 Alloy Steel Bolting	Cast Iron, ASTM A48 Class 20	Class 20 Gray Cast Iron
B7M Alloy Steel Bolting	B7M Alloy Steel Bolting	Cast Iron, ASTM A48 Class 30	Class 30 Gray Cast Iron
B8 Stainless Steel Bolting	B8 Stainless Steel Bolting	Cast Iron, ASTM A48 Class 40	Class 40 Gray Cast Iron
B8M Stainless Steel Bolting	B8M Stainless Steel Bolting	Cast Iron, ASTM A532 Cl III, Tp A	Class III Type A White Cast Iron
Brass, B16	C36000 Free Cutting Brass	Cast Iron, High Chromium White	Class III Type A White Cast Iron
Brass, Free Cutting	C36000 Free Cutting Brass	Cast M152 SST	Cast M152 SST
Brass, Free Cutting Yellow	C36000 Free Cutting Brass	CB7Cu-1 SST Casting	CB7Cu-1 SST Casting
Brass, Free Machining	C36000 Free Cutting Brass	CB7Cu-2 SST Casting	CB7Cu-2 SST Casting
Brass, Free Turning	C36000 Free Cutting Brass	CD4MCu SST Casting	CD4MCu SST Casting
Brass, High Leaded	C36000 Free Cutting Brass	CD7MCuN SST Casting	CD7MCuN SST Casting
Brass, Leaded Red, Cast	CB8600 Cast Leaded Red Brass	CF3 SST Casting	CF3 SST Casting
Brass, Uninhibited Naval	C46400 Naval Brass, Uninhibited	CF3M SST Casting	CF3M SST Casting
Brass, Yellow, High Strength, Cast	C86500 Cast Manganese Bronze	CF8 SST Casting	CF8 SST Casting
Bronze, 88-12 Gear, Cast	C90800 Cast Tin Bronze	CFBC SST Casting	CFBC SST Casting
Bronze, Aluminum 7%	C61400 Aluminum Bronze D	CFBM SST Casting	CFBM SST Casting
Bronze, Aluminum 9C, Cast	C95400 Cast Aluminum Bronze	CG3M SST Casting	CG3M SST Casting
Bronze, Aluminum 9D, Cast	C95500 Cast Aluminum Bronze	CG6MMN SST Casting	CG6MMN SST Casting
Bronze, Aluminum C, Cast	C95400 Cast Aluminum Bronze	CGBM SST Casting	CGBM SST Casting
Bronze, Aluminum D	C61400 Aluminum Bronze D	Chrome Plating	Cr Plate
Bronze, Aluminum D, Cast	C95500 Cast Aluminum Bronze	Chrome-Moly Steel, 4140	G41400 Alloy Steel
Bronze, High Silicon	C66100 Silicon Bronze	Chrome-Moly Steel, C12	C12 Alloy Steel Casting
Bronze, Manganese, Cast	C86500 Cast Manganese Bronze	Chrome-Moly Steel, C5	C5 Alloy Steel Casting
Bronze, Navy "M", Cast	C92200 Cast Leaded Tin Bronze	Chrome-Moly Steel, WC6	WC6 Alloy Steel Casting
Bronze, Silicon	C66100 Silicon Bronze	Chrome-Moly Steel, WC9	WC9 Alloy Steel Casting
Bronze, Steam, Cast	C92200 Cast Leaded Tin Bronze	CK20 SST Casting	CK20 SST Casting
Bronze, Valve, Cast	C92200 Cast Leaded Tin Bronze	Class 20 Gray Cast Iron	Class 20 Gray Cast Iron
C, Alloy, Cast (Obsolete)	CW12M-1 Nickel Alloy Casting	Class 30 Gray Cast Iron	Class 30 Gray Cast Iron
C, Alloy, Cast (Obsolete)	CW12MW Nickel Alloy Casting	Class 40 Gray Cast Iron	Class 40 Gray Cast Iron
C12 Alloy Steel Casting	C12 Alloy Steel Casting	Class A Gray Cast Iron	Class A Gray Cast Iron
C12000 Copper (DLP)	C12000 Copper (DLP)	Class B Gray Cast Iron	Class B Gray Cast Iron
C12000 DLP Copper	C12200 Copper (DHP)	Class C Gray Cast Iron	Class C Gray Cast Iron
C12200 Copper (DHP)	C12200 DHP Copper	Class III Type A White Cast Iron	Class III Type A White Cast Iron
C12200 DHP Copper	G12144 Carbon Steel	CN7M Nickel Alloy Casting	CN7M Nickel Alloy Casting
C12L14 Steel, AISI	N06022 Nickel Alloy	Cobalt 6, Cast	R30006 Cobalt Alloy Casting
C22, Alloy	Cast Alloy C22 <i>(C-22)</i>	Cobalt Chrome 6, Cast	R30006 Cobalt Alloy Casting
C22, Alloy, Cast			

*(C-22)*

Table 1. Cross-Reference Sorted by Common/Tradename/Other Designation (continued)

Common/Tradename/ Other Designation	Standard Designation	Common/Tradename/ Other Designation	Standard Designation
CoCr-A Hardfacing Alloy	CoCr-A Hardfacing Alloy	F11401 Gray Cast Iron	Class 20 Gray Cast Iron
CoCr-A, Cast (Erroneous)	R30006 Cobalt Alloy Casting	F11501 Gray Cast Iron	Class A Gray Cast Iron
CoCr-A, Wrought (Erroneous)	Alloy 6B Cobalt Alloy	F12101 Gray Cast Iron	Class 30 Gray Cast Iron
CoCr-B Hardfacing Alloy	CoCr-B Hardfacing Alloy	F12102 Gray Cast Iron	Class B Gray Cast Iron
CoCr-B, Cast (Erroneous)	Alloy 12 Cobalt Alloy Casting	F12801 Gray Cast Iron	Class 40 Gray Cast Iron
CoCr-C Hardfacing Alloy	CoCr-C Hardfacing Alloy	F12802 Gray Cast Iron	Class C Gray Cast Iron
CoCr-C, Cast (Erroneous)	Alloy 3 Cobalt Alloy Casting	F22000 Malleable Cast Iron	A197 Malleable Cast Iron
Colmonoy 4, Hardfacing <sup>(6)</sup>	NiCr-A Hardfacing Alloy	F22200 Malleable Cast Iron	32510 Malleable Iron
Colmonoy 5, Hardfacing	NiCr-B Hardfacing Alloy	F32800 Cast Iron, Ductile	60-40-18 Ductile Cast Iron
Colmonoy 6, Cast	NiCr-6 Nickel Alloy Casting	F33100 Cast Iron, Ductile	65-45-12 Ductile Cast Iron
Colmonoy 6, Hardfacing	NiCr-C Hardfacing Alloy	P33800 Cast Iron, Ductile	80-55-06 Ductile Cast Iron
Commercially Pure Nickel	N02200 Nickel Alloy	F41000 Cast Iron, Austenitic	Type 1 Austenitic Cast Iron
Commercially Pure Nickel, Low Crbn	N02201 Nickel Alloy	F41001 Cast Iron, Austenitic	Type 1b Austenitic Cast Iron
Composition Metal	C83600 Cast Leaded Red Brass	F41002 Cast Iron, Austenitic	Type 2 Austenitic Cast Iron
Copper Silicon	C66100 Silicon Bronze	F41003 Cast Iron, Austenitic	Type 2b Austenitic Cast Iron
Copper, DHP	C12200 DHP Copper	F41004 Cast Iron, Austenitic	Type 3 Austenitic Cast Iron
Copper, DLP	C12000 DLP Copper	F41005 Cast Iron, Austenitic	Type 4 Austenitic Cast Iron
Copper-Nickel, 70-30	C96400 Cast Copper Nickel	F41006 Cast Iron, Austenitic	Type 5 Austenitic Cast Iron
Cr Plate	A02080 Aluminum Alloy Casting	F43000 Ductile Iron, Austenitic	Type D-2 Austenitic Ductile Iron
CS43A Aluminum (Obsolete)	C96400 Cast Copper Nickel	F43001 Ductile Iron, Austenitic	Type D-2B Austenitic Ductile Iron
Cupro-Nickel, 70-30	S45000 SST	F43002 Ductile Iron, Austenitic	Type D-2C Austenitic Ductile Iron
Custom 450	S17400 SST	F43003 Ductile Iron, Austenitic	Type D-3 Austenitic Ductile Iron
Custom 630	CW12M-1 Nickel Alloy Casting	F43004 Ductile Iron, Austenitic	Type D-3A Austenitic Ductile Iron
CW12M-1 Nickel Alloy Casting	CW12MW Nickel Alloy Casting	F43004 Ductile Iron, Austenitic	Type D-3A Austenitic Ductile Iron
CW2M Nickel Alloy Casting	CW2M Nickel Alloy Casting	F43005 Ductile Iron, Austenitic	Type D-4 Austenitic Ductile Iron
CW6MC Nickel Alloy Casting	CY40 Nickel Alloy Casting	F43006 Ductile Iron, Austenitic	Type D-5 Austenitic Ductile Iron
CY40 Nickel Alloy Casting	CZ100 Nickel Alloy Casting	F43007 Ductile Iron, Austenitic	Type D-5B Austenitic Ductile Iron
CZ100 Nickel Alloy Casting	Alloy D Cast Nickel-Silicon Alloy	F43010 Ductile Iron, Austenitic	Type D-2M Austenitic Ductile Iron
D, Nickel-Based Alloy	Type D-2 Austenitic Ductile Iron	F45009 White Cast Iron	Class III Type A White Cast Iron
D-2, Austenitic Ductile Iron	Type D-2 Austenitic Ductile Iron	Fansteel 60	R05255 Tantalum Tungsten Alloy
D-2, Ductile Ni-Resist <sup>(7)</sup>	Type D-2B Austenitic Ductile Iron	Ferrallium 255 <sup>(11)</sup>	S32550 SST
D-2B, Austenitic Ductile Iron	Type D-2B Austenitic Ductile Iron	Ferrallium 255 SST, Cast	CD7MCuN SST Casting
D-2B, Ductile Ni-Resist	Type D-2B Austenitic Ductile Iron	G, Alloy (Obsolete)	N06007 Nickel Alloy
D-2C, Austenitic Ductile Iron	Type D-2C Austenitic Ductile Iron	G10080 Carbon Steel	G10080 Carbon Steel
D-2C, Ductile Ni-Resist	Type D-2C Austenitic Ductile Iron	G10100 Carbon Steel	G10100 Carbon Steel
D-2M, Austenitic Ductile Iron	Type D-2M Austenitic Ductile Iron	G10180 Carbon Steel	G10180 Carbon Steel
D-2M, Ductile Ni-Resist	Type D-2M Austenitic Ductile Iron	G10200 Carbon Steel	G10200 Carbon Steel
D-3, Austenitic Ductile Iron	Type D-3 Austenitic Ductile Iron	G10300 Carbon Steel	G10300 Carbon Steel
D-3, Ductile Ni-Resist	Type D-3 Austenitic Ductile Iron	G10450 Carbon Steel	G10450 Carbon Steel
D-3A, Austenitic Ductile Iron	Type D-3A Austenitic Ductile Iron	G10800 Carbon Steel	G10800 Carbon Steel
D-3A, Ductile Ni-Resist	Type D-3A Austenitic Ductile Iron	G10950 Carbon Steel	G10950 Carbon Steel
D-4, Austenitic Ductile Iron	Type D-4 Austenitic Ductile Iron	G12144 Carbon Steel	G12144 Carbon Steel
D-4, Ductile Ni-Resist	Type D-4 Austenitic Ductile Iron	G2, Alloy	N06975 Nickel Alloy
D-5, Austenitic Ductile Iron	Type D-5 Austenitic Ductile Iron	G3, Alloy	N06985 Nickel Alloy
D-5, Ductile Ni-Resist	Type D-5 Austenitic Ductile Iron	G30, Alloy	N06030 Nickel Alloy
D-5B, Austenitic Ductile Iron	Type D-5B Austenitic Ductile Iron	G41400 Alloy Steel	G41400 Alloy Steel
D-5B, Ductile Ni-Resist	Type D-5B Austenitic Ductile Iron	G43400 Alloy Steel	G43400 Alloy Steel
D-5S, Austenitic Ductile Iron	Type D-5S Austenitic Ductile Iron	S41800 SST	S41800 SST
D-5S, Ductile Ni-Resist	Type D-5S Austenitic Ductile Iron	Cast Grade 615 SST	Cast Grade 615 SST
D712.0, Aluminum Alloy Casting	A07130 Aluminum Alloy Casting	C90500 Cast Tin Bronze	C90500 Cast Tin Bronze
DIN 17730 #2.4365	M30C Nickel Alloy Casting	T20811 Tool Steel	T20811 Tool Steel
Drill Rod	G10800 Carbon Steel	T20813 Tool Steel	T20813 Tool Steel
Drill Rod	G10950 Carbon Steel	H51500 Alloy Steel	H51500 Alloy Steel
Ductile Iron 60-40-18	60-40-18 Ductile Cast Iron	H51600 Alloy Steel	H51600 Alloy Steel
Ductile Iron 65-45-12	65-45-12 Ductile Cast Iron	Hard Chrome Plating	Cr Plate
Ductile Iron 80-55-06	80-55-06 Ductile Cast Iron	Hastelloy B <sup>(13)</sup> (Obsolete)	N10001 Nickel Alloy
Ductile Ni-Resist Type D-2	Type D-2 Austenitic Ductile Iron	Hastelloy B, Cast (Obsolete)	N12MV Nickel Alloy Casting
Ductile Ni-Resist Type D-2B	Type D-2B Austenitic Ductile Iron	Hastelloy B2	N1D655 Nickel Alloy
Ductile Ni-Resist Type D-2C	Type D-2C Austenitic Ductile Iron	Hastelloy B2, Cast	N7M Nickel Alloy Casting
Ductile Ni-Resist Type D-2M	Type D-2M Austenitic Ductile Iron	Hastelloy C, Cast (Obsolete)	CW12M-1 Nickel Alloy Casting
Ductile Ni-Resist Type D-3	Type D-3 Austenitic Ductile Iron	Hastelloy C, Cast (Obsolete)	CW12MW Nickel Alloy Casting
Ductile Ni-Resist Type D-4	Type D-4 Austenitic Ductile Iron	Hastelloy C22	N06022 Nickel Alloy
Ductile Ni-Resist Type D-5	Type D-5 Austenitic Ductile Iron	Hastelloy C22, Cast	Cast Alloy C-22
Ductile Ni-Resist Type D-5B	Type D-5B Austenitic Ductile Iron	Hastelloy C276	N10276 Nickel Alloy
Ductile Ni-Resist Type D-5S	Type D-5S Austenitic Ductile Iron	Hastelloy C4	N06455 Nickel Alloy
Duranickel 301 <sup>(8)</sup>	N03301 Nickel Alloy	Hastelloy C4, Cast	CW2M Nickel Alloy Casting
Durimet 20 SST <sup>(9)</sup>	CN7M Nickel Alloy Casting	Hastelloy D	CW2M Nickel Alloy Casting
E-Brite 26-1	S44626 SST	Hastelloy G (Obsolete)	Alloy D Cast Nickel-Silicon Alloy
Elgiloy <sup>(10)</sup>	R30003 Co-Cr-Ni-Fe-Mo (Elgiloy)	Hastelloy G2	N06007 Nickel Alloy
			N06975 Nickel Alloy

Table 1. Cross-Reference Sorted by Common/Tradename/Other Designation (continued)

Common/Tradename/ Other Designation	Standard Designation	Common/Tradename/ Other Designation	Standard Designation
Hastelloy G3	N06985 Nickel Alloy	Monel 410, Cast	M35-1 Nickel Alloy Casting
Hastelloy G30	N06030 Nickel Alloy	Monel 411, Cast	M30C Nickel Alloy Casting
Hastelloy N	N10003 Nickel Alloy	Monel 505	M25S Nickel Alloy Casting
Hastelloy X	N06002 Nickel Alloy	Monel 506, Cast	M35H Nickel Alloy Casting
Haynes 25	R30605 Co-Cr-Ni-W Alloy	Monel K-500	N05500 Nickel Alloy
High Chromium White Iron	Class III Type A White Cast Iron	Monel R-405	N04405 Nickel Alloy
Incoloy <sup>(14)</sup>	N08800 Nickel Alloy	Monel, Cast	M35-1 Nickel Alloy Casting
Incoloy 800	N08800 Nickel Alloy	N, Alloy	N10003 Nickel Alloy
Incoloy 800, Cast	Cast Alloy 800	ND2200 Nickel Alloy	N02200 Nickel Alloy
Incoloy 825	N08825 Nickel Alloy	N02201 Nickel Alloy	N02201 Nickel Alloy
Incoloy 825, Cast	Cast Alloy 825	N03301 Nickel Alloy	N03301 Nickel Alloy
Incoloy 925	N09925 Nickel Alloy	N04400 Nickel Alloy	N04400 Nickel Alloy
Incoloy 925, Cast	Cast Alloy 925	ND4405 Nickel Alloy	N04405 Nickel Alloy
Inconel <sup>(15)</sup>	N06600 Nickel Alloy	ND5500 Nickel Alloy	N05500 Nickel Alloy
Inconel 600	N06600 Nickel Alloy	N06002 Nickel Alloy	N06002 Nickel Alloy
Inconel 600, Cast	CY40 Nickel Alloy Casting	N06007 Nickel Alloy	N06007 Nickel Alloy
Inconel 610, Cast (Obsolete)	CY40 Nickel Alloy Casting	N06022 Nickel Alloy	N06022 Nickel Alloy
Inconel 625	N06625 Nickel Alloy	N06030 Nickel Alloy	N06030 Nickel Alloy
Inconel 625, Cast	CW6MC Nickel Alloy Casting	ND640	CY40 Nickel Alloy Casting
Inconel 706	N09706 Nickel Alloy	N06455 Nickel Alloy	N06455 Nickel Alloy
Inconel 718	N07718 Nickel Alloy	N06600 Nickel Alloy	N06600 Nickel Alloy
Inconel X	N07750 Nickel Alloy	N06625 Nickel Alloy	N06625 Nickel Alloy
Inconel X750	N07750 Nickel Alloy	N06975 Nickel Alloy	N06985 Nickel Alloy
J02503	WCC Carbon Steel Casting	N06985 Nickel Alloy	N07718 Nickel Alloy
J03002	WCB Carbon Steel Casting	N07718 Nickel Alloy	N07750 Nickel Alloy
J03003	LCB Carbon Steel Casting	N07750 Nickel Alloy	CN7M Nickel Alloy Casting
J12072	WC6 Alloy Steel Casting	NDBD07 Nickel Alloy	N08020 Nickel Alloy
J12522	WC1 Alloy Steel Casting	N08D20 Nickel Alloy	N08B00 Nickel Alloy
J21890	WC9 Alloy Steel Casting	N08B25 Nickel Alloy	N08B25 Nickel Alloy
J42045	C5 Alloy Steel Casting	N09706 Nickel Alloy	N09706 Nickel Alloy
J82090	C12 Alloy Steel Casting	N09902 Nickel Alloy	N09902 Nickel Alloy
J91150	CA15 SST Casting	N09925 Nickel Alloy	N09925 Nickel Alloy
J91540	CA6NM SST Casting	N10001 Nickel Alloy	N10001 Nickel Alloy
J91631	Cast Grade 615 SST	N10003 Nickel Alloy	N10003 Nickel Alloy
J92110	CB7Cu-2 SST Casting	N10276 Nickel Alloy	N10276 Nickel Alloy
J92200	CB7Cu-1 SST Casting	N10665 Nickel Alloy	N10665 Nickel Alloy
J92500	CF3 SST Casting	N12MV Nickel Alloy Casting	N12MV Nickel Alloy Casting
J92600	CF8 SST Casting	N7M Nickel Alloy Casting	N7M Nickel Alloy Casting
J92710	CF8C SST Casting	Navy "M"	C92200 Cast Leaded Tin Bronze
J92800	CF3M SST Casting	Ni-Resist Type 1	Type 1 Austenitic Cast Iron
J92900	CF8M SST Casting	Ni-Resist Type 1b	Type 1b Austenitic Cast Iron
J93000	CG8M SST Casting	Ni-Resist Type 2	Type 2 Austenitic Cast Iron
J94202	CK20 SST Casting	Ni-Resist Type 2b	Type 2b Austenitic Cast Iron
J95150	CN7M Nickel Alloy Casting	Ni-Resist Type 3	Type 3 Austenitic Cast Iron
Jethete M152 <sup>(16)</sup> SST, Cast	Cast M152 SST	Ni-Resist Type 4	Type 4 Austenitic Cast Iron
Jethete M152 SST, Wrought	S64152 SST	Ni-Resist Type 5	Type 5 Austenitic Cast Iron
K-Monel	N05500 Nickel Alloy	NI-Span C <sup>(17)</sup> Alloy 902	N09902 Nickel Alloy
K-Monel 500	N05500 Nickel Alloy	Nickel 200	N02200 Nickel Alloy
KD3009	LF1 Carbon Steel Forging	Nickel 200, Cast	CZ100 Nickel Alloy Casting
KD3011	LF2 Carbon Steel Forging	Nickel 201	N02201 Nickel Alloy
KD3504	SA105 Carbon Steel Forging	Nickel 210, Cast (Obsolete)	CZ100 Nickel Alloy Casting
K500, Alloy	N05500 Nickel Alloy	Nickel Steel, 3-1/2 Ni	LC3 Alloy Steel Casting
L-605	R30605 Co-Cr-Ni-W Alloy	Nickel, Cast	CZ100 Nickel Alloy Casting
LC3 Alloy Steel Casting	LC3 Alloy Steel Casting	Nickel, Commercially Pure	N02200 Nickel Alloy
LCB Carbon Steel Casting	LCB Carbon Steel Casting	Nickel, Commercially Pure	N02201 Nickel Alloy
LF1 Carbon Steel Forging	LF1 Carbon Steel Forging	Nickel-Chrome-Boron Hardfacing	NiCr-C Hardfacing Alloy
LF2 Carbon Steel Forging	LF2 Carbon Steel Forging	Nickel-Chrome-Moly Steel	G43400 Alloy Steel
M152 SST, Wrought	S64152 SST	NiCr-6, Nickel Alloy Casting	NiCr-6 Nickel Alloy Casting
M25S Nickel Alloy Casting	M25S Nickel Alloy Casting	NiCr-A Hardfacing Alloy	NiCr-A Hardfacing Alloy
M30C Nickel Alloy Casting	M30C Nickel Alloy Casting	NiCr-B Hardfacing Alloy	NiCr-B Hardfacing Alloy
M35-1 Nickel Alloy Casting	M35-1 Nickel Alloy Casting	NiCr-C Hardfacing Alloy	NiCr-C Hardfacing Alloy
M35H Nickel Alloy Casting	M35H Nickel Alloy Casting	Nitronic 50 <sup>(18)</sup> SST	S20910 SST
M35W	M35-1 Nickel Alloy Casting	Nitronic 50 SST, Cast	CG6MMN SST Casting
Malleable Iron, Grade 32510	32510 Malleable Iron	Nitronic 60 SST	S21800 SST
Malleable Iron, Grade 35018	35018 Malleable Iron	Nucalloy 41 <sup>(19)</sup> , Cast	NiCr-6 Nickel Alloy Casting
Modified 410, Cast	CA6NM SST Casting	Ounce Metal	C83600 Cast Leaded Red Brass
Moly Steel, 1/2 Mo	WC1 Alloy Steel Casting	PH 13-8 Mo SST	S13R00 SST
Monel	N04400 Nickel Alloy	PH 15-7 Mo SST	S157D0 SST
Monel 400	N04400 Nickel Alloy	Pyromet 600	N06600 Nickel Alloy
Monel 400, Cast	M35-1 Nickel Alloy Casting		
Monel 405	N04405 Nickel Alloy		

Table 1. Cross-Reference Sorted by Common/Tradename/Other Designation (continued)

Common/Tradename/ Other Designation	Standard Designation	Common/Tradename/ Other Designation	Standard Designation
Pyromet 625	N06625 Nickel Alloy	S44004 SST	S44004 SST
Pyromet 718	N07718 Nickel Alloy	S44626 SST	S44626 SST
Pyromet A2B6	S66286 SST	S44735 SST	S44735 SST
Pyromet X-750	N07750 Nickel Alloy	S45000 SST	S45000 SST
QQ-N-288 Composition A	M35-1 Nickel Alloy Casting	S50200 SST	S50200 SST
QQ-N-288 Composition D	M25S Nickel Alloy Casting	S64152 SST	S64152 SST
QQ-N-288 Composition E	M30C Nickel Alloy Casting	S66286 SST	S66286 SST
R-Monel	N04405 Nickel Alloy	SA-105 Carbon Steel Forging	SA105 Carbon Steel Forging
R-Monel 405	N04405 Nickel Alloy	Stellite 1(20), Hardfacing	CoCr-C Hardfacing Alloy
R05200 Tantalum	R05200 Tantalum	Stellite 12, Cast	Alloy 12 Cobalt Alloy Casting
R05255 Tantalum Tungsten Alloy	R05255 Tantalum Tungsten Alloy	Stellite 12, Hardfacing	CoCr-B Hardfacing Alloy
R05400 Tantalum, Comm. Pure, Sintered	R05400 Tantalum, Comm. Pure, Sintered	Stellite 21	Alloy 21 Cobalt Alloy Casting
R30003 Co-Cr-Ni-Fe-Mo (Elgiloy)	R30003 Co-Cr-Ni-Fe-Mo (Elgiloy)	Stellite 3, Cast	Alloy 3 Cobalt Alloy Casting
R30006 Cobalt Alloy Casting	R30006 Cobalt Alloy Casting	Stellite 6, Cast	R30006 Cobalt Alloy Casting
R30605 Co-Cr-Ni-W Alloy	R30605 Co-Cr-Ni-W Alloy	Stellite 6, Hardfacing	CoCr-A Hardfacing Alloy
R50250 Titanium Alloy	R50250 Titanium Alloy	Stellite 6B	Alloy 6B Cobalt Alloy
R50250 Titanium Alloy Casting	R50250 Titanium Alloy Casting	Stoody 1, Hardfacing	CoCr-C Hardfacing Alloy
R50400 Titanium Alloy	R50400 Titanium Alloy	Stoody 12, Cast	Alloy 12 Cobalt Alloy Casting
R50400 Titanium Alloy Casting	R50400 Titanium Alloy Casting	Stoody 12, Hardfacing	CoCr-B Hardfacing Alloy
R50550 Titanium Alloy	R50550 Titanium Alloy	Stoody 3, Cast	Alloy 3 Cobalt Alloy Casting
R50550 Titanium Alloy Casting	R50550 Titanium Alloy Casting	Stoody 4, Hardfacing	NiCr-A Hardfacing Alloy
R50700 Titanium Alloy	R50700 Titanium Alloy	Stoody 41, Cast	NiCr-6 Nickel Alloy Casting
R50700 Titanium Alloy Casting	R50700 Titanium Alloy Casting	Stoody 5, Hardfacing	NiCr-B Hardfacing Alloy
R54520 Titanium Alloy	R54520 Titanium Alloy	Stoody 6, Cast	R30006 Cobalt Alloy Casting
R54520 Titanium Alloy Casting	R54520 Titanium Alloy Casting	Stoody 6, Hardfacing	CoCr-A Hardfacing Alloy
R56400 Titanium Alloy	R56400 Titanium Alloy	T20811 Hot Work Tool Steel (H11)	T20811 Tool Steel
R56400 Titanium Alloy Casting	R56400 Titanium Alloy Casting	T20813 Hot Work Tool Steel (H13)	T20813 Tool Steel
R60701 Zirconium Alloy	R60701 Zirconium Alloy	Ta-10W	R05255 Tantalum Tungsten Alloy
R60702 Zirconium Alloy	R60702 Zirconium Alloy	Tantaloy(21)	R05255 Tantalum Tungsten Alloy
R60802 Zirconium Alloy	R60802 Zirconium Alloy	Tantalum, Commercially Pure	R05200 Tantalum
R60804 Zirconium Alloy	R60804 Zirconium Alloy	Tantalum, Sintered	R05400 Tantalum, Comm. Pure, Sintered
S. Alloy, Cast	M25S Nickel Alloy Casting	Tantalum-10%Tungsten	R05255 Tantalum Tungsten Alloy
S-Monel, Cast	M25S Nickel Alloy Casting	Ti-5Al-2 5Sn	R54520 Titanium Alloy
S13800 SST	S13800 SST	Ti-5Al-2.5Sn, Cast	R54520 Titanium Alloy Casting
S15500 SST	S15500 SST	Ti-6Al-4V	R56400 Titanium Alloy
S15700 SST	S15700 SST	Ti-6Al-4V, Cast	R56400 Titanium Alloy Casting
S17400 SST	S17400 SST	Titanium Grade 1, Unalloyed	R50250 Titanium Alloy
S17700 SST	S17700 SST	Titanium Grade 2, Unalloyed	R50400 Titanium Alloy
S18200 SST	S18200 SST	Titanium Grade 3, Unalloyed	R50550 Titanium Alloy
S20910 SST	S20910 SST	Titanium Grade 4, Unalloyed	R50700 Titanium Alloy
S21800 SST	S21800 SST	Titanium Grade 5	R56400 Titanium Alloy
S30100 SST	S30100 SST	Titanium Grade 6	R54520 Titanium Alloy
S30200 SST	S30200 SST	Titanium Grade C1, Cast, Unalloyed	R50250 Titanium Alloy Casting
S30300 SST	S30300 SST	Titanium Grade C2, Cast, Unalloyed	R50400 Titanium Alloy Casting
S30323 SST	S30323 SST	Titanium Grade C3, Cast, Unalloyed	R50550 Titanium Alloy Casting
S30400 SST	S30400 SST	Titanium Grade C4, Cast, Unalloyed	R50700 Titanium Alloy Casting
S30403 SST	S30403 SST	Titanium Grade C5, Cast	R56400 Titanium Alloy Casting
S30409 SST	S30409 SST	Titanium Grade C6, Cast	R54520 Titanium Alloy Casting
S31000 SST	S31000 SST	TMT 601(22)	TMT 601
S31254 SST	S31254 SST	Tribaloy T-700(23)	Tribaloy T700
S31600 SST	S31600 SST	Tribaloy T700	Type 1 Austenitic Cast Iron
S31603 SST	S31603 SST	Type 1, Ni-Resist	Type 1 Austenitic Cast Iron
S31609 SST	S31609 SST	Type 1b Austenitic Cast Iron	Type 1b Austenitic Cast Iron
S31700 SST	S31700 SST	Type 1b, Ni-Resist	Type 1b Austenitic Cast Iron
S31703 SST	S31703 SST	Type 2 Austenitic Cast Iron	Type 2 Austenitic Cast Iron
S31803 SST	S31803 SST	Type 2, Ni-Resist	Type 2 Austenitic Cast Iron
S32100 SST	S32100 SST	Type 2b Austenitic Cast Iron	Type 2b Austenitic Cast Iron
S32550 SST	S32550 SST	Type 2b, Ni-Resist	Type 2b Austenitic Cast Iron
S32900 SST	S32900 SST	Type 3 Austenitic Cast Iron	Type 3 Austenitic Cast Iron
S32950 SST	S32950 SST	Type 3, Ni-Resist	Type 3 Austenitic Cast Iron
S34700 SST	S34700 SST	Type 4 Austenitic Cast Iron	Type 4 Austenitic Cast Iron
S41000 SST	S41000 SST	Type 4, Ni-Resist	Type 4 Austenitic Cast Iron
S41600 SST	S41600 SST	Type 5 Austenitic Cast Iron	Type 5 Austenitic Cast Iron
S41800 SST	S41800 SST	Type 5, Ni-Resist	Type 5 Austenitic Cast Iron
S42000 SST	S42000 SST		
S42200 SST	S42200 SST		
S43000 SST	S43000 SST		
S43100 SST	S43100 SST		
S44002 SST	S44002 SST		
S44003 SST	S44003 SST		

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Table 1. Cross-Reference Sorted by Common/Tradename/Other Designation (continued)

Common/Tradename/ Other Designation	Standard Designation	Common/Tradename/ Other Designation	Standard Designation
Type D-2 Austenitic Ductile Iron	Type D-2 Austenitic Ductile Iron	White Iron	Class III Type A White Cast Iron
Type D-2B Austenitic Ductile Iron	Type D-2B Austenitic Ductile Iron	Wiscalloy M152 SST <sup>(26)</sup>	Cast M152 SST
Type D-2C Austenitic Ductile Iron	Type D-2C Austenitic Ductile Iron	X, Alloy	N06002 Nickel Alloy
Type D-2M Austenitic Ductile Iron	Type D-2M Austenitic Ductile Iron	X750, Alloy	N07750 Nickel Alloy
Type D-3 Austenitic Ductile Iron	Type D-3 Austenitic Ductile Iron	X750, Pyromet	N0775D Nickel Alloy
Type D-3A Austenitic Ductile Iron	Type D-3A Austenitic Ductile Iron	XM-19 SST	S20910 SST
Type D-4 Austenitic Ductile Iron	Type D-4 Austenitic Ductile Iron	XM-19 SST, Cast	CG6MMN SST Casting
Type D-5 Austenitic Ductile Iron	Type D-5 Austenitic Ductile Iron	XM-33 SST	S44626 SST
Type D-5B Austenitic Ductile Iron	Type D-5B Austenitic Ductile Iron	Z33520 Zinc Die Casting	Z33520 Zinc Die Casting
Type D-5S Austenitic Ductile Iron	Type D-5S Austenitic Ductile Iron	Z35531 Zinc Die Casting	Z35531 Zinc Die Casting
Uniloy 605 <sup>(24)</sup>	R30605 Co-Cr-Ni-W Alloy	ZC81A Aluminum Casting	A07130 Aluminum Alloy Casting
Vascojet 1000 <sup>(25)</sup>	T20811 Tool Steel	ZG61A Aluminum Casting	A47120 Aluminum Alloy Casting
WC1	WC1 Alloy Steel Casting	Zinc Die Casting	Z33520 Zinc Die Casting
WC1 Alloy Steel Casting	WC1 Alloy Steel Casting	Zinc Die Casting	Z33531 Zinc Die Casting
WC6	WC6 Alloy Steel Casting	Zircaloy 2	R60802 Zirconium Alloy
WC6 Alloy Steel Casting	WC6 Alloy Steel Casting	Zircaloy 4	R60804 Zirconium Alloy
WC9	WC9 Alloy Steel Casting	Zircaloy 802	R60802 Zirconium Alloy
WC9 Alloy Steel Casting	WC9 Alloy Steel Casting	Zircaloy 804	R60804 Zirconium Alloy
WCB	WCB Carbon Steel Casting	Zirconium 701	R60701 Zirconium Alloy
WCB Carbon Steel Casting	WCB Carbon Steel Casting	Zirconium 702	R60702 Zirconium Alloy
WCC	WCC Carbon Steel Casting	Zirconium Alloy 802	R60802 Zirconium Alloy
WCC Carbon Steel Casting	WCC Carbon Steel Casting	Zirconium Alloy 804	R60804 Zirconium Alloy

Table 2. Cross-Reference Sorted by Standard Designation

Standard Designation	Common/Tradename/ Other Designation	Standard Designation	Common/Tradename/ Other Designation
32510 Malleable Iron	32510 Malleable Iron F22200 Malleable Cast Iron Malleable Iron, Grade 32510	A197 Malleable Cast Iron	A197 Malleable Cast Iron F22000 Malleable Cast Iron
35018 Malleable Iron	35018 Malleable Iron Malleable Iron, Grade 35018	A47120 Aluminum Alloy Casting	713 0, Aluminum Alloy Casting A47120 Aluminum Alloy Casting ZG61A Aluminum Casting
60-40-18 Ductile Cast Iron	60-40-18 Ductile Cast Iron Ductile Iron 60-40-18 F32800 Cast Iron, Ductile	A91100 Aluminum Alloy Wrought	1100 Aluminum A91100 Aluminum Alloy Wrought
65-45-12 Ductile Cast Iron	65-45-12 Ductile Cast Iron Ductile Iron 65-45-12 F33100 Cast Iron, Ductile	A92011 Aluminum Alloy Wrought	2011 Aluminum A92011 Aluminum Alloy Wrought
80-55-06 Ductile Cast Iron	80-55-06 Ductile Cast Iron Ductile Iron 80-55-06 F33800 Cast Iron, Ductile	A92017 Aluminum Alloy Wrought	2017 Aluminum A92017 Aluminum Alloy Wrought
A02080 Aluminum Alloy Casting	208.0, Aluminum Alloy Casting A02080 Aluminum Alloy Casting CS43A Aluminum (Obsolete)	A92024 Aluminum Alloy Wrought	2024 Aluminum A92024 Aluminum Alloy Wrought
A03190 Aluminum Alloy Casting	319.0, Aluminum Alloy Casting A03190 Aluminum Alloy Casting	A93003 Aluminum Alloy Wrought	3003 Aluminum A93003 Aluminum Alloy Wrought
A03550 Aluminum Alloy Casting	355 0, Aluminum Alloy Casting A03550 Aluminum Alloy Casting	A95052 Aluminum Alloy Wrought	5052 Aluminum A95052 Aluminum Alloy Wrought
A03560 Aluminum Alloy Casting	356 0, Aluminum Alloy Casting A03560 Aluminum Alloy Casting	A96061 Aluminum Alloy Wrought	6061 Aluminum A96061 Aluminum Alloy Wrought
A03600 Aluminum Alloy Die Casting	360.0, Aluminum Die Casting A03600 Aluminum Alloy Die Casting	A96063 Aluminum Alloy Wrought	6063 Aluminum A96063 Aluminum Alloy Wrought
A03800 Aluminum Alloy Die Casting	380.0, Aluminum Alloy Die Casting A03800 Aluminum Alloy Die Casting	A97075 Aluminum Alloy Wrought	7075 Aluminum A97075 Aluminum Alloy Wrought
A07120 Aluminum Alloy Casting	712.0, Aluminum Alloy Casting A07120 Aluminum Alloy Casting	Alloy 12 Cobalt Alloy Casting	12, Alloy, Cast Alloy 12, Cast
A07130 Aluminum Alloy Casting	A07130 Aluminum Alloy Casting D712.0, Aluminum Alloy Casting	Alloy 21 Cobalt Alloy Casting	Alloy 12, Cobalt Alloy Casting CoCr-B, Cast (Erroneous)
A13600 Aluminum Alloy Die Casting	ZC81A Aluminum Casting A13600 Aluminum Alloy Die Casting	Alloy 21 Cobalt Alloy Casting	Stellite 12, Cast Stody 12, Cast
A13800 Aluminum Alloy Die Casting	A360.0, Aluminum Die Casting A13800 Aluminum Alloy Die Casting	Alloy 3 Cobalt Alloy Casting	21, Alloy Alloy 21 Alloy 21, Cobalt Alloy Casting Stellite 21
	A380.0, Aluminum Alloy Die Casting	Alloy 3 Cobalt Alloy Casting	3, Alloy, Cast Alloy 3, Cast Alloy 3, Cobalt Alloy Casting CoCr-C, Cast (Erroneous)

Table 2. Cross-Reference Sorted by Standard Designation (Continued)

Standard Designation	Common/Tradename/ Other Designation	Standard Designation	Common/Tradename/ Other Designation
Alloy 6B Cobalt Alloy	6. Alloy, Wrought Alloy 6, Wrought Alloy 6B, Cobalt Alloy CoCr-A, Wrought (Erroneous) Stellite 6B	C86500 Cast Manganese Bronze	865, CDA Alloy, Cast 865, CDA Cast Alloy Brass, Yellow, High Strength, Cast Bronze, Manganese, Cast C86500 Cast Manganese Bronze
Alloy D Cast Nickel-Silicon Alloy	Alloy D, Cast Nickel-Silicon Alloy D, Nickel-Base Alloy Hastelloy D	C90500 Cast Tin Bronze	905, CDA Alloy, Cast C90500 Cast Tin Bronze Gun Metal
B6 Alloy Steel Bolting	410 SST Bolting ASME SA193 Grade B6 B6 Alloy Steel Bolting	C90800 Cast Tin Bronze	908, CDA Alloy, Cast Bronze, BB-12 Gear, Cast C90800 Cast Tin Bronze
B7 Alloy Steel Bolting	4140, Bolting ASME SA193 Grade B7	C92200 Cast Leaded Tin Bronze	922, CDA Alloy, Cast Bronze, Navy "M", Cast Bronze, Steam, Cast Bronze, Valve, Cast C92200 Cast Leaded Tin Bronze Navy "M"
B7M Alloy Steel Bolting	B7 Alloy Steel Bolting 4140, Bolting (NACE) ASME SA193 Grade B7M B7M Alloy Steel Bolting	C95400 Cast Aluminum Bronze	954, CDA Cast Alloy Bronze, Aluminum 9C, Cast Bronze, Aluminum C, Cast C95400 Cast Aluminum Bronze
B8 Stainless Steel Bolting	304 SST, Bolting ASME SA193 Grade B8	C95500 Cast Aluminum Bronze	955, CDA Cast Alloy Bronze, Aluminum 9D, Cast Bronze, Aluminum D, Cast C95500 Cast Aluminum Bronze
B8M Stainless Steel Bolting	B8 Stainless Steel Bolting 316 SST, Bolting ASME SA193 Grade B8M	C96400 Cast Copper Nickel	954, CDA Alloy, Cast C96400 Cast Copper Nickel Copper-Nickel, 70-30 Cupro-Nickel, 70-30
C12 Alloy Steel Casting	B8M Stainless Steel Bolting 9 Cr-1 Mo Steel Casting C12 Alloy Steel Casting Chrome-Moly Steel, C12 J82090	CA15 SST Casting	410 SST, Cast CA15 SST Casting J91150
C12000 Copper (DLP)	120, CDA C12000 Copper (DLP) C12000 DLP Copper Copper, DLP	CA28MWV SST Casting	422 SST, Cast CA28MWV SST Casting
C12200 Copper (DHP)	122, CDA C12200 Copper (DHP) C12200 DHP Copper Copper, DHP	CA6NM SST Casting	410 Modified, Cast 410 SST Modified, Cast CA6NM SST Casting J91540
C36000 Free Cutting Brass	360, CDA Alloy B16 Brass Brass, B16 Brass, Free Cutting Brass, Free Cutting Yellow Brass, Free Machining Brass, Free Turning Brass, High Leaded C36000 Free Cutting Brass	Cast Alloy 800	Modified 410, Cast 800, Alloy, Cast Alloy 800, Cast Cast Alloy 800 Incoloy 800, Cast
C46400 Naval Brass, Uninhibited	464, CDA Alloy Brass, Uninhibited Naval C46400 Naval Brass, Uninhibited	Cast Alloy 825	825, Alloy, Cast Alloy 825, Cast Cast Alloy 825 Incoloy 825, Cast
C5 Alloy Steel Casting	5 Cr-1/2 Mo Steel Casting C5 Alloy Steel Casting Chrome-Moly Steel, C5 J42045	Cast Alloy 925	925, Alloy, Cast Alloy 925, Cast Cast Alloy 925 Incoloy 925, Cast
C61400 Aluminum Bronze D	614, CDA Alloy Bronze, Aluminum 7% Bronze, Aluminum D C61400 Aluminum Bronze D	Cast Alloy C22- C-ZZ	Alloy C22, Cast C22, Alloy, Cast
C66100 Silicon Bronze	661, CDA Alloy Bronze, High Silicon Bronze, Silicon C66100 Silicon Bronze Copper Silicon	Cast Grade 615 SST	Cast Alloy C22 Hastelloy C22, Cast 418 SST, Cast
CB3600 Cast Leaded Red Brass	836, CDA Cast Alloy Brass, Leaded Red, Cast CB3600 Cast Leaded Red Brass Composition Metal Ounce Metal	Cast M152 SST	Cast Grade 615 SST Greek Ascoloy SST J91631 Cast M152 SST
		CB7Cu-1 SST Casting	Jethete M152 SST, Cast Wiscalloy M152 SST 17-4 PH SST, Cast 17-4 SST, Cast CB7Cu-1 SST Casting J92200

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Table 2. Cross-Reference Sorted by Standard Designation (Continued)

Standard Designation	Common/Tradename/ Other Designation	Standard Designation	Common/Tradename/ Other Designation
CB7Cu-2 SST Casting	15-5 PH SST, Cast 15-5 SST, Cast CB7Cu-2 SST Casting J92110	CoCr-A Hardfacing Alloy	6, Alloy, Hardfacing Alloy 6, Hardfacing CoCr-A Hardfacing Alloy Stellite 6, Hardfacing Stody 6, Hardfacing
CD4MCu SST Casting	Cast Duplex SST CD4MCu SST Casting	CoCr-B Hardfacing Alloy	12, Alloy, Hardfacing Alloy 12, Hardfacing CoCr-B Hardfacing Alloy Stellite 12, Hardfacing Stody 12, Hardfacing
CD7MCuN SST Casting	Cast Duplex SST CD7MCuN SST Casting Ferralium 255 SST, Cast	CoCr-C Hardfacing Alloy	1, Alloy, Hardfacing CoCr-C Hardfacing Alloy Stellite 1, Hardfacing Stody 1, Hardfacing
CF3 SST Casting	304 ELC SST, Cast 304L SST, Cast CF3 SST Casting J925D0	Cr Plate	Chrome Plating Cr Plate
CF3M SST Casting	316 ELC SST, Cast 316L SST, Cast CF3M SST Casting J928D0	CW12M-1 Nickel Alloy Casting	Hard Chrome Plating Alloy C, Cast (Obsolete) C, Alloy, Cast (Obsolete)
CFB SST Casting	304 SST, Cast CFB SST Casting J926D0	CW12MW Nickel Alloy Casting	CW12M-1 Nickel Alloy Casting Hastelloy C, Cast (Obsolete) Alloy C, Cast (Obsolete) C, Alloy, Cast (Obsolete)
CF8C SST Casting	347 SST, Cast CF8C SST Casting J927D0	CW2M Nickel Alloy Casting	CW12MW Nickel Alloy Casting Hastelloy C, Cast (Obsolete) Alloy C4, Cast Alloy C4C, Cast
CF8M SST Casting	316 SST, Cast CF8M SST Casting J929D0	CW6MC Nickel Alloy Casting	C4, Alloy, Cast C4C, Alloy, Cast CW2M Nickel Alloy Casting Hastelloy C4, Cast Hastelloy C4C, Cast
CG3M SST Casting	317 ELC SST, Cast 317L SST, Cast CG3M SST Casting	CY40 Nickel Alloy Casting	625, Alloy, Cast Alloy 625, Cast CW6MC Nickel Alloy Casting Inconel 625, Cast 600, Alloy, Cast
CG6MMN SST Casting	CG6MMN SST Casting Nilronic 50 SST, Cast	CZ100 Nickel Alloy Casting	610, Alloy, Cast (Obsolete) Alloy 600, Cast Alloy 610, Cast (Obsolete) CY40 Nickel Alloy Casting Inconel 600, Cast
CG8M SST Casting	XM-19 SST, Cast 317 SST, Cast CGBM SST Casting J930D0	G10080 Carbon Steel	Inconel 610, Cast (Obsolete) N06040
CK20 SST Casting	310 SST, Cast CK20 SST Casting J942D2	G10100 Carbon Steel	200, Alloy, Cast 210, Alloy, Cast (Obsolete)
Class 20 Gray Cast Iron	Cast Iron, ASTM A48 Class 20 Class 20 Gray Cast Iron F11401 Gray Cast Iron	G10180 Carbon Steel	Alloy 200, Cast Alloy 210, Cast (Obsolete)
Class 30 Gray Cast Iron	Cast Iron, ASTM A48 Class 30 Class 30 Gray Cast Iron F12101 Gray Cast Iron	G10200 Carbon Steel	CZ100 Nickel Alloy Casting Nickel 200, Cast
Class 40 Gray Cast Iron	Cast Iron, ASTM A48 Class 40 Class 40 Gray Cast Iron F12801 Gray Cast Iron	G10300 Carbon Steel	Nickel 210, Cast (Obsolete)
Class A Gray Cast Iron	Cast Iron, ASTM A126 Class A Class A Gray Cast Iron F11501 Gray Cast Iron	G10450 Carbon Steel	Nickel, Cast
Class B Gray Cast Iron	Cast Iron, ASTM A126 Class B Class B Gray Cast Iron F12102 Gray Cast Iron	G10800 Carbon Steel	1008, AISI
Class C Gray Cast Iron	Cast Iron, ASTM A126 Class C Class C Gray Cast Iron F12802 Gray Cast Iron	G10950 Carbon Steel	G10080 Carbon Steel
Class III Type A White Cast Iron	25% Chromium White Iron Cast Iron, ASTM A532 Cl III, Tp A Cast Iron, High Chromium White Class III Type A White Cast Iron F45009 White Cast Iron High Chromium White Iron White Iron		1010, AISI
CN7M Nickel Alloy Casting	20, Alloy, Cast Alloy 20, Cast CN7M Nickel Alloy Casting Durimet 20 SST J95150 N08007 Nickel Alloy		G10100 Carbon Steel
			1018, AISI
			G10180 Carbon Steel
			1020, AISI
			G10200 Carbon Steel
			1030, AISI
			G10300 Carbon Steel
			1045, AISI
			G10450 Carbon Steel
			1080, AISI
			Drill Rod
			G10800 Carbon Steel
			1095, AISI
			Drill Rod
			G10950 Carbon Steel

Table 2. Cross-Reference Sorted by Standard Designation (Continued)

Standard Designation	Common/Tradename/ Other Designation	Standard Designation	Common/Tradename/ Other Designation
G12144 Carbon Steel	12L14 Steel, AISI C12L14 Steel, AISI G12144 Carbon Steel	N04400 Nickel Alloy	400, Alloy Alloy 400 Monel Monel 400 N04400 Nickel Alloy
G41400 Alloy Steel	4140, AISI Chrome-Moly Steel, 4140	N04405 Nickel Alloy	405, Alloy Alloy 405 Alloy R405 Monel 405 Monel R-405 N04405 Nickel Alloy
G43400 Alloy Steel	G43400 Alloy Steel Nickel-Chrome-Moly Steel		R-Monel R-Monel 405
H51500 Alloy Steel	5150H, AISI H51500 Alloy Steel		Alloy K500 K-Monel
H51600 Alloy Steel	5160H, AISI H51600 Alloy Steel	N05500 Nickel Alloy	K-Monel 500 K500, Alloy Monel K-500 N05500 Nickel Alloy
LC3 Alloy Steel Casting	LC3 Alloy Steel Casting	N06002 Nickel Alloy	680, Grade Alloy X Hastelloy X N06002 Nickel Alloy
LCB Carbon Steel Casting	Nickel Steel, 3-1/2 Ni J03D03	N06007 Nickel Alloy	X, Alloy Alloy G (Obsolete) G, Alloy (Obsolete) Hastelloy G (Obsolete)
LF1 Carbon Steel Forging	LCB Carbon Steel Casting K03009	N06022 Nickel Alloy	N06007 Nickel Alloy C-22 D Alloy C-22 C-22 ②
LF2 Carbon Steel Forging	LF1 Carbon Steel Forging K03011	N06030 Nickel Alloy	Hastelloy C-22 C-22 ② N06022 Nickel Alloy Alloy G30 G30 ④
M25S Nickel Alloy Casting	LF2 Carbon Steel Forging 505, Alloy 505, Monel Alloy 505 Alloy S, Cast M25S Nickel Alloy Casting Monel 505 QQ-N-288 Composition D	N06455 Nickel Alloy	Hastelloy G30 G30 ④ N06030 Nickel Alloy Alloy C4 C4, Alloy Hastelloy C4 N06455 Nickel Alloy
M30C Nickel Alloy Casting	S, Alloy, Cast S-Monel, Cast Alloy 411, Cast DIN 17730 #2.4365 M30C Nickel Alloy Casting Monel 411, Cast QQ-N-288 Composition E	N06600 Nickel Alloy	600, Alloy 600, Pyromet Alloy 600 Inconel Inconel 600 N06600 Nickel Alloy
M35-1 Nickel Alloy Casting	400, Alloy, Cast 410, Alloy, Cast Alloy 400, Cast Alloy 410, Cast (Nickel Alloy)	N06625 Nickel Alloy	Pyromet 600 625, Alloy 625, Pyromet Alloy 625 Inconel 625 N06625 Nickel Alloy
M35H Nickel Alloy Casting	M35-1 Nickel Alloy Casting M35W Monel 400, Cast Monel 410, Cast Monel, Cast QQ-N-288 Composition A	N06975 Nickel Alloy	Pyromet 625 Alloy G2 G2, Alloy Hastelloy G2 N06975 Nickel Alloy
N02200 Nickel Alloy	506, Alloy, Cast 506, Monel, Cast Alloy 505, Cast M35H Nickel Alloy Casting Monel 506, Cast 200, Alloy Alloy 200 Commercially Pure Nickel	N06985 Nickel Alloy	Alloy G3 G3, Alloy Hastelloy G3 N06985 Nickel Alloy
N02201 Nickel Alloy	N02200 Nickel Alloy Nickel 200 Nickel, Commercially Pure 201, Alloy Alloy 201 Commercially Pure Nickel, Low Crbn	N07718 Nickel Alloy	718, Alloy 718, Pyromet Alloy 718 Inconel 718 N07718 Nickel Alloy
N03301 Nickel Alloy	N02201 Nickel Alloy Nickel 201 Nickel, Commercially Pure 301, Nickel Alloy Alloy 301 Duranickel 301 ND3301 Nickel Alloy		Pyromet 718

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Table 2. Cross-Reference Sorted by Standard Designation (Continued)

Standard Designation	Common/Tradename/ Other Designation	Standard Designation	Common/Tradename/ Other Designation
N07750 Nickel Alloy	Alloy X750 Inconel X Inconel X750 N07750 Nickel Alloy Pyromet X-750 X750, Alloy X750, Pyromet	R05200 Tantalum	R05200 Tantalum Tantalum, Commercially Pure
N08020 Nickel Alloy	20, Alloy (Obsolete) 20Cb-3, Alloy Alloy 20 Alloy 20 (Obsolete) Alloy 20Cb-3 Carpenter 20 (Obsolete) Carpenter 20Cb-3 N08020 Nickel Alloy	R05255 Tantalum Tungsten Alloy	Fansteel 60 R05255 Tantalum Tungsten Alloy Ta-10W Tantaloy Tantalum-10% Tungsten
N08800 Nickel Alloy	BOD, Alloy Alloy 800 Incoloy Incoloy 800 N08800 Nickel Alloy	R05400 Tantalum, Comm. Pure, Sintered	R05400 Tantalum, Comm. Pure, Sintered
N08825 Nickel Alloy	B25, Alloy Alloy B25 Incoloy 825 N08825 Nickel Alloy	R30003 Co-Cr-Ni-Fe-Mo (Elgiloy)	Elgiloy R30003 Co-Cr-Ni-Fe-Mo (Elgiloy)
N09706 Nickel Alloy	706, Alloy Alloy 706 Inconel 706 N09706 Nickel Alloy	R30006 Cobalt Alloy Casting	6, Alloy, Cast Alloy 6, Cast Cobalt 6, Cast Cobalt Chrome 6, Cast CoCr-A, Cast (Erroneous)
N09902 Nickel Alloy	N09902 Nickel Alloy Ni-Span C Alloy 902	R30605 Co-Cr-Ni-W Alloy	R30006 Cobalt Alloy Casting Stellite 6, Cast Stoody 6, Cast 25, Alloy 25, Haynes 670, AISI
N09925 Nickel Alloy	925, Alloy Alloy 925 Incoloy 925 N09925 Nickel Alloy	R50250 Titanium Alloy	Alloy 25 Haynes 25 L-605 R30605 Co-Cr-Ni-W Alloy
N10001 Nickel Alloy	Alloy B (Obsolete) B, Alloy (Obsolete) Hastelloy B (Obsolete) N10001 Nickel Alloy	R50400 Titanium Alloy	Uniloy 605 R50250 Titanium Alloy Titanium Grade 1, Unalloyed
N10003 Nickel Alloy	Alloy N Hastelloy N N, Alloy N10003 Nickel Alloy	R50550 Titanium Alloy	R50250 Titanium Alloy Casting Titanium Grade C1, Cast, Unalloyed
N10276 Nickel Alloy	Alloy C276 C276, Alloy Hastelloy C276 N10276 Nickel Alloy	R50700 Titanium Alloy	R50400 Titanium Alloy Titanium Grade 2, Unalloyed
N10665 Nickel Alloy	Alloy B2 B2, Alloy Hastelloy B2 N10665 Nickel Alloy	R54520 Titanium Alloy	R50400 Titanium Alloy Casting Titanium Grade C2, Cast, Unalloyed
N12MV Nickel Alloy Casting	Alloy B, Cast (Obsolete) B, Alloy, Cast (Obsolete) Hastelloy B, Cast (Obsolete) N12MV Nickel Alloy Casting	R54520 Titanium Alloy Casting	R50550 Titanium Alloy Titanium Grade 3, Unalloyed
N7M Nickel Alloy Casting	Alloy B2, Cast B2, Alloy, Cast Hastelloy B2, Cast N7M Nickel Alloy Casting	R56400 Titanium Alloy	R50550 Titanium Alloy Casting Titanium Grade C3, Cast, Unalloyed
NiCr-6 Nickel Alloy Casting	Colmonoy 6, Cast NiCr-6, Nickel Alloy Casting Nucalloy 41, Cast	R56400 Titanium Alloy Casting	R50700 Titanium Alloy Titanium Grade 4, Unalloyed
NiCr-A Hardfacing Alloy	Stoody 41, Cast Colmonoy 4, Hardfacing NiCr-A Hardfacing Alloy	R60701 Zirconium Alloy	R50700 Titanium Alloy Casting Titanium Grade C4, Cast, Unalloyed
NiCr-B Hardfacing Alloy	Stoody 4, Hardfacing Colmonoy 5, Hardfacing NiCr-B Hardfacing Alloy	R60702 Zirconium Alloy	R54520 Titanium Alloy Ti-5Al-2 5Sn
NiCr-C Hardfacing Alloy	Stoody 5, Hardfacing Colmonoy 6, Hardfacing Nickel-Chrome-Boron Hardfacing NiCr-C Hardfacing Alloy	R60802 Zirconium Alloy	Titanium Grade 6 54520 Titanium Alloy Casting Ti-5Al-2 5Sn, Cast

Table 2. Cross-Reference Sorted by Standard Designation (Continued)

Standard Designation	Common/Tradename/ Other Designation	Standard Designation	Common/Tradename/ Other Designation
R60B04 Zirconium Alloy	R60B04 Zirconium Alloy Zircaloy 4 Zircaloy 804 Zirconium Alloy 804 13-8 Mo SST PH 13-8 Mo SST S13800 SST	S32550 SST	Alloy 255 Duplex SST Ferralium Duplex SST S32550 Duplex BST 329 Duplex SST S32900 Duplex SST
S13800 SST	13-8 Mo SST PH 13-8 Mo SST S13800 SST	S32950 SST	7 Mo Plus Duplex SST Carpenter 7 Mo Plus Duplex SST S32950 Duplex SST
S15500 SST	15-5 PH SST 15-5 SST S15500 SST	S34700 SST	347 SST S34700 S8T
S15700 SST	15-7 Mo SST PH 15-7 Mo SST S15700 SST	S41000 SST	410 SST S41000 SST
S17400 SST	17-4 PH SST 17-4 SST 630, Custom Custom 630 S17400 SST	S41600 SST	416 SST S41600 SST
S17700 SST	17-7 PH SST 17-7 SST S17700 SST	S41800 SST	615 SST Greek Ascoloy S41800 SST
S18200 SST	18-2 SST S18200 SST	S42000 SST	420 SST S42000 SST
S20910 SST	22-13-5 SST 22Cr-13Ni-5Mn SST, Carpenter Niltronic 50 SST S20910 SST XM-19 SST	S42200 SST	422 SST 616 SST 636, Carpenter S42200 SST
S21800 SST	85 Nuts Niltronic 60 SST S21800 SST	S43000 SST	430 SST S43000 SST
S30100 SST	301 SST S30100 SST	S43100 SST	431 SST S43100 SST
S30200 SST	302 SST S30200 SST	S44002 SST	440A SST S44002 SST
S30300 SST	303 SST S30300 SST	S44003 SST	440B SST S44003 SST
S30323 SST	303Se SST S30323 SST	S44004 SST	440C SST S44004 SST
S30400 SST	304 SST S30400 SST	S44626 SST	26-1, E-Brite E-Brite 26-1
S30403 SST	304 ELC SST 304L SST S30403 SST	S44735 SST	S44626 SST
S30409 SST	304H SST S30409 SST	S45000 SST	XM-33 SST 29-4C SST
S31000 SST	310 SST S31000 SST	S50200 SST	S44735 SST
S31254 SST	254SMO SST Avesta 254SMO S31254 SST	S64152 SST	450 SST 450, Custom Custom 450
S31600 SST	316 SST S31600 SST	S66286 SST	S45000 SST CS, Wrought S50200 SST
S31603 SST	316 ELC SST 316L SST S31603 SST	SA105 Carbon Steel Forging	Jethete M152 SST, Wrought M152 SST, Wrought
S31609 SST	316H SST S31609 SST	T20811 Tool Steel	S64152 SST 660 SST, Grade
S31700 SST	317 SST S31700 SST	T20813 Tool Steel	A286 SST, Grade
S31703 SST	317 ELC SST 317L SST S31703 SST	TMT 601	A286, Pyromet Pyromet A286
S31803 SST	2205 Duplex SST S31803 Duplex S8T 321 SST S32100 SST	Tribaloy T700	S66286 SST K03504 SA105 Carbon Steel Forging H11 Tool Steel T20811 Hot Work Tool Steel (H11) Vascojet 1000
S32100 SST		Type 1 Austenitic Cast Iron	H13 Tool Steel T20813 Hot Work Tool Steel (H13) TMT TMT 601 Tribaloy T-700 Tribaloy T700 F41000 Cast Iron, Austenitic Ni-Resist Type 1 Type 1 Austenitic Cast Iron Type 1, Ni-Resist

Table 2. Cross-Reference Sorted by Standard Designation (Continued)

Standard Designation	Common/Tradename/ Other Designation	Standard Designation	Common/Tradename/ Other Designation
Type 1b Austenitic Cast Iron	F41001 Cast Iron, Austenitic Ni-Resist Type 1b Type 1b Austenitic Cast Iron Type 1b, Ni-Resist F41002 Cast Iron, Austenitic Ni-Resist Type 2 Type 2 Austenitic Cast Iron Type 2, Ni-Resist F41003 Cast Iron, Austenitic Ni-Resist Type 2b Type 2b Austenitic Cast Iron Type 2b, Ni-Resist F41004 Cast Iron, Austenitic Ni-Resist Type 3 Type 3 Austenitic Cast Iron Type 3, Ni-Resist F41005 Cast Iron, Austenitic Ni-Resist Type 4 Type 4 Austenitic Cast Iron Type 4, Ni-Resist F41006 Cast Iron, Austenitic Ni-Resist Type 5 Type 5 Austenitic Cast Iron Type 5, Ni-Resist D-2, Austenitic Ductile Iron D-2, Ductile Ni-Resist Ductile Ni-Resist Type D-2 F43000 Ductile Iron, Austenitic Type D-2 Austenitic Ductile Iron D-2B, Austenitic Ductile Iron D-2B, Ductile Ni-Resist Ductile Ni-Resist Type D-2B F43001 Ductile Iron, Austenitic Type D-2B Austenitic Ductile Iron D-2C, Austenitic Ductile Iron D-2C, Ductile Ni-Resist Ductile Ni-Resist Type D-2C F43002 Ductile Iron, Austenitic Type D-2C Austenitic Ductile Iron D-2M, Austenitic Ductile Iron D-2M, Ductile Ni-Resist Ductile Ni-Resist Type D-2M F43010 Ductile Iron, Austenitic Type D-2M Austenitic Ductile Iron D-3, Austenitic Ductile Iron D-3, Ductile Ni-Resist Ductile Ni-Resist Type D-3 F43003 Ductile Iron, Austenitic Type D-3 Austenitic Ductile Iron	Type D-3A Austenitic Ductile Iron	D-3A, Austenitic Ductile Iron D-3A, Ductile Ni-Resist F43004 Ductile Iron, Austenitic F43004 Ductile Iron, Austenitic Type D-3A Austenitic Ductile Iron Type D-4 Austenitic Ductile Iron D-4, Austenitic Ductile Iron D-4, Ductile Ni-Resist Ductile Ni-Resist Type D-4 F43005 Ductile Iron, Austenitic Type D-4 Austenitic Ductile Iron D-5, Austenitic Ductile Iron D-5, Ductile Ni-Resist Ductile Ni-Resist Type D-5 F43006 Ductile Iron, Austenitic Type D-5 Austenitic Ductile Iron D-5B, Austenitic Ductile Iron D-5B, Ductile Ni-Resist Ductile Ni-Resist Type D-5B F43007 Ductile Iron, Austenitic Type D-5B Austenitic Ductile Iron D-5S, Austenitic Ductile Iron D-5S, Ductile Ni-Resist Ductile Ni-Resist Type D-5S Type D-5S Austenitic Ductile Iron WC1 Alloy Steel Casting J12522 Moly Steel, 1/2 Mo WC1 WC6 Alloy Steel Casting J12072 WC6 WC9 Alloy Steel Casting J21890 WC9 WC9 Alloy Steel Casting J03002 WCB WCB Carbon Steel Casting J02503 WCC Z33520 Zinc Die Casting AG40A, Zinc Alloy Die Casting Z33520 Zinc Die Casting Zinc Die Casting Z33531 Zinc Die Casting AG41A, Zinc Alloy Die Casting Z35531 Zinc Die Casting
Type D-2 Austenitic Ductile Iron		WC1 Alloy Steel Casting	Carbon-Moly Steel J12522 Moly Steel, 1/2 Mo WC1 WC6 Alloy Steel Casting 1-1/4 Cr-1/2 Mo Steel Casting Chrome-Moly Steel, WC6 J12072 WC6 WC6 Alloy Steel Casting 2-1/2 Cr-1 Mo Steel Casting Chrome-Moly Steel, WC9 J21890 WC9 WC9 Alloy Steel Casting J03002 WCB WCB Carbon Steel Casting J02503 WCC WCC Carbon Steel Casting AG40A, Zinc Alloy Die Casting Z33520 Zinc Die Casting Zinc Die Casting Z33531 Zinc Die Casting AG41A, Zinc Alloy Die Casting Z35531 Zinc Die Casting
Type D-2B Austenitic Ductile Iron		WC6 Alloy Steel Casting	
Type D-2C Austenitic Ductile Iron		WC9 Alloy Steel Casting	
Type D-2M Austenitic Ductile Iron		WCB Carbon Steel Casting	
Type D-3 Austenitic Ductile Iron		WCC Carbon Steel Casting	
		Z33520 Zinc Die Casting	AG40A, Zinc Alloy Die Casting Z33520 Zinc Die Casting Zinc Die Casting
		Z33531 Zinc Die Casting	AG41A, Zinc Alloy Die Casting Z35531 Zinc Die Casting

1. Haynes is a trademark of Haynes International.
2. E-Brite is a trademark of Allegheny Ludlum Steel.
3. Monel is a trademark of Inco International.
4. Pyromet is a trademark of Carpenter Technology.
5. 7 Mo Plus is a trademark of Carpenter Technology.
6. Colmonoy is a trademark of Wall Colmonoy.
7. Ni-Resist is a trademark of Inco International.
8. Duranickel is a trademark of Inco International.
9. Durimet 20 is a trademark of Duriron.
10. Elgiloy is a trademark of Elgiloy Co.
11. Ferallium is a trademark of Langley Alloys.
12. Greek Ascoloy is a trademark of Firth Stirling.
13. Hastelloy is a trademark of Haynes International.

14. Incoloy is a trademark of Inco International.
15. Inconel is a trademark of Inco International.
16. Jetelite is a trademark of Samuel Fox and Co.
17. Ni-Span is a trademark of Inco International.
18. Nitronic is a trademark of Armco Steel.
19. Nucalloy is a trademark of Stoody.
20. Stellite is a trademark of Stoody.
21. Tantaloy is a trademark of Fansteel.
22. TMT is a trademark of Turbine Metal Technology.
23. Tribaloy is a trademark of Stoody.
24. Uniroy is a trademark of Universal-Cyclops Specialty Steel Division.
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BUCHANAN INGERSOLL, PC.

Mr. Lynn Alstadt  
Buchanan Ingersoll PC  
One Oxford Centre  
301 Grant Street, 20<sup>th</sup> Floor  
Pittsburgh, PA 15219-1410

Re: Use of Haynes Trademarks

Dear Mr. Alstadt,

Your letter addressed to Mr. Tom Snead of Fisher-Rosemount Systems dated September 13, 2005 was passed to me for response. This letter was in regard to the use of Haynes Trademarks in Fisher Technical Monograph 35, Standardizing Metallic Material Designations, written by Don Bush.

We acknowledge that two other Hayes registered trademarks; C-22® and G-30® have not been identified correctly in the Technical Monograph 35 document.

As you have requested this Technical Monograph 35, Standardizing Metallic Material Designations, has been removed from the Fisher Controls Regulator and Valve Division websites and all distribution has ceased.

If you have any further questions, please do not hesitate to contact me.

Regards,

Danny Nelson  
Director, Global Technology  
Fisher Controls International, LLC  
Email: [danny.nelson@emersonprocess.com](mailto:danny.nelson@emersonprocess.com)  
Phone: 641-754-3250  
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September 12, 2005

**VIA FACSIMILE AND FIRST CLASS MAIL**

Russell W. Kirchner, President  
High Performance Alloys, Inc.  
444 Wilson Street  
Tipton, IN 46072

Re: Use of Haynes Trademarks

Dear Mr. Kirchner:

We represent Haynes International, Inc. As you know, Haynes has several registered trademarks for the metal alloys that you purchase from Haynes and re-sell to your customers. The marks are listed on the enclosed report from the United States Patent and Trademark Office. While you may use Haynes' trademarks in conjunction with the sale of products that you purchase from Haynes, any use of Haynes' trademarks should indicate that the trademarks you use are trademarks of Haynes International. In addition, you may not offer to sell a product under a Haynes trademark and then substitute an alloy from another manufacturer when an order is received.

Enclosed is a copy of your web pages in which Haynes' HASTELLOY registered trademark is used correctly, but Haynes registered C-22 trademark is used incorrectly. We, therefore, ask that you immediately make the corrections described below and noted in red on the enclosed copies.

When used in sentence a trademark should be used as an adjective, e.g., C-22® alloy. The ® designation should appear as a superscript adjacent to the end of each trademark. This designation should be used everywhere the registered mark appears. There should also be a line added that says: "HASTELLOY and C-22 are registered trademarks of Haynes International, Inc."

Continued use of the enclosed web pages or any brochures in which the Haynes trademarks appear without being identified as such constitutes misuse of Haynes trademarks. If such misuse continues Haynes will be required to take legal action against your company to stop the misuse or lose valuable trademark rights. It is our hope that you will promptly change the web pages so that Haynes is not forced to choose between suing an important customer or losing its trademark rights.

HE 00766

September 12, 2005

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Please tell me by September 30, 2005, whether you will change your web pages and, if so, when the change will be made.

Should you decide to use any Haynes trademarks in any future web pages, brochures or advertisements, I suggest that you send a draft to me or Paul Manning at Haynes International for review before the web page, brochure or advertisement is published. We will promptly review your publication and correct any incorrect use of a Haynes trademark.

If you have any questions or concerns, please call me.

Very truly yours,



Lynn J. Alstadt

LJA/bem

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cc: Paul Manning (w/encl.)

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## HASTELLOY® Alloy C-22

HASTELLOY Alloy C-22 is a nickel-chromium-molybdenum alloy with enhanced resistance to pitting, crevice corrosion and stress corrosion cracking. It resists the formation of grain boundary precipitates in the weld-heat affected zone making it suitable for use in the as-welded condition. C-22 has outstanding resistance to both reducing and oxidizing media and because of its resistibility can be used where "upset" conditions are likely to occur. It is proven to possess excellent weldability and high corrosion resistance as consumable filler wires and electrodes. The alloy has proven results as a filler wire in many applications. As filler wire use when other corrosion resistant wires have failed.

C-22 can easily be cold-worked because of its ductility and cold-forming is the preferred method of forming. More energy is required because the alloy is generally stiffer than austenitic stainless steels. 0.28" thick sheet in the heat-treated at 2050°F, rapid quenched condition, has an average Olsen cup depth of 0.49".

## Machining

Nickel & cobalt base corrosion, temperature and wear-resistant alloys are classified as moderate to difficult when machining, however, it should be emphasized that these alloys can be machined using conventional production methods at satisfactory rates. During machining these alloys work harden rapidly, generate high heat during cutting, weld to the cutting tool surface and offer high resistance to metal removal because of their high shear strengths. The following are key points which should be considered during machining operations:

**CAPACITY** - Machine should be rigid and overpowered as much as possible.

**RIGIDITY** - Work piece and tool should be held rigid. Minimize tool overhang.

**TOOL SHARPNESS** - Make sure tools are sharp at all times. Change to sharpened tools at regular intervals rather than out of necessity. A 0.015 inch wear land is considered a dull tool.

**TOOLS** - Use positive rake angle tools for most machining operations. Negative rake angle tools can be considered for intermittent cuts and heavy stock removal. Carbide-tipped tools are suggested for most applications. High speed tools can be used, with lower production rates, and are often recommended for intermittent cuts.

**POSITIVE CUTS** - Use heavy, constant, feeds to maintain positive cutting action. If feed slows and the tool dwells in the cut, work hardening occurs, tool life deteriorates and close tolerances are impossible.

**LUBRICATION** - lubricants are desirable, soluble oils are recommended especially when using carbide tooling. Detailed machining parameters are presented Tables 16 and 17. General plasma cutting recommendations are presented in Table 18.

**Table 16****RECOMMENDED TOOL TYPES AND MACHINING CONDITIONS**

Operations	Carbide Tools
Roughing, with severe interruption	Turning or Facing C-2 and C-3 grade: Negative rake square insert, 45 degree SCEA1, 1/32 in. nose radius. Tool holder: 5 degree neg. back rake, 5 degree neg. side rake. Speed: 30-50 sfm, 0.004-0.008 in. feed, 0.150 in depth of cut. Dry2, oil3, or water-base coolant4.
Normal roughing	Turning or Facing C-2 or C-3 grade: Negative rate square insert, 45 degree SCEA, 1/32 in nose radius. Tool holder: 5 degree neg. back rake, 5 degree neg. side rake. Speed: 90 sfm depending on rigidity of set up, 0.010 in. feed, 0.150 in. depth of cut. Dry, oil, or water-base coolant.
Finishing	Turning or Facing C-2 or C-3 grade: Positive rake square insert, if possible, 45 degree SCEA, 1/32 in. nose radius. Tool holder: 5 degree pos. back rake, 5 degree pos. side rake. Speed: 95-110 sfm, 0.005-0.007 in. feed, 0.040 in. depth of cut. Dry or water-base coolant.
Rough Boring	C-2 or C-3 grade: If insert type boring bar, use standard positive rake tools with largest possible SCEA and 1/16 in. nose radius. If brazed tool bar, grind 0 degree back rake, 10 degree pos. side rake, 1/32 in. nose radius and largest possible SCEA. Speed: 70 sfm depending on the rigidity of setup, 0.005-0.008 in. feed, 1/8 in. depth of cut. Dry, oil or water-base coolant.
Finish Boring	C-2 or C-3 grade: Use standard positive rake tools on insert type bars. Grind brazed tools as for finish turning and facing except back rake may be best at 0 degrees. Speed: 95-110 sfm, 0.002-0.004 in feed. Water-base coolant.
Notes:	
1 SCEA- Side cutting edge angle or lead angle of the tool.	
2 At any point where dry cutting is recommended, an air jet directed on the tool may provide substantial tool life increases. A water-base coolant mist may also be effective.	
3 Oil coolant should be premium quality, sulfochlorinated oil with extreme pressure additives. A viscosity at 100 degrees F from 50 to 125 SSU.	
4 Water-base coolant should be premium quality, sulfochlorinated water soluble oil or chemical emulsion with extreme pressure additives. Dilute with water to make 15:1 mix. Water-base coolant may cause chipping and rapid failure of carbide tools in interrupted cuts.	

**Table 17****RECOMMENDED TOOL TYPES AND MACHINING CONDITIONS**

<b>Operations</b>	<b>Carbide Tools</b>
Facing Milling	Carbide not generally successful, C- grade may work. Use positive axial and radial rake, 45 degree corner angle, 10 degree relief angle. Speed: 50-60 sfm. Feed: 0.005-0.008 in. Oil or waterbase coolants will reduce thermal shock damage of carbide cutter teeth.
End Milling	Not recommended , but C-2 grades may be successful on good setups. Use positive rake. Speed: 50-60 sfm. Feed: Same as high speed steel. Oil or water-base coolants will reduce thermal shock damage.
Drilling	C-2 grade not recommended, but tipped drills may be successful on rigid setup if no great depth. The web must thinned to reduce thrust. Use 135 degree included angle on point. Gun drill can be used. Speed: 50 sfm. Oil or water-base coolant. Coolant-feed carbide tipped drills may be economical in some setups.
Reaming	C-2 or C-3 grade: Tipped reamers recommended, solid carbide reamers require vary good setup. Tool geometry same as high speed steel. Speed: 50 sfm. Feed: Same as high speed steel.
Tapping	Not recommended, machine threads, or roll-form them.
Electrical Discharge Machining	The alloys can be easily cut using any conventional electrical discharge machining system (EDM) or wire (EDM).
<b>Notes:</b>	
5 M-40 series High Speed Steels include M-41 , M-42, M-43, M-44, M-45 and M-46 at the time of writing. Others may be added and should be equally suitable.	
6 Oil coolant should be a premium quality, sulfochlorinated oil with extreme pressure additives. A viscosity at 100 degree F from 50 to 125 SSU.	
7 Water-base coolant should be premium quality, sulfochlorinated water soluble oil or chemical emulsion with extreme pressure additives. Dilute with water to make 15:1 mix.	

**Table 18****Plasma Arc Cutting**

Our alloys can be cut using any conventional plasma arc cutting system. The best arc quality is achieved using a mixture of argon and hydrogen gases. Nitrogen gas can be substituted for hydrogen gases, but the cut quality will deteriorate slightly. Shop air or any oxygen bearing gases should be avoided when plasma cutting these alloys.

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Nominal Chemistry						
Ni	Cr	Mo	W	Fe	C	Si
Bal.	22.0	13.5 Max	3.0 Max	4.0 Max	0.015 Max	0.08 Max

## Average Tensile Data, Solution Heat-Treated

Form	Temp °F(°C)	UTS (Ksi)	YS 0.2% (Ksi)	Elon. in 2" (%)
Sheet, 0.028-0.125" (0.71-3.2mm) thick**	Room 200(93) 400(204) 600(316) 800(427) 1000(538) 1200(649) 1400(760)	116 110 102 98 95 91 95 76	59 54 44 42 41 40 36 35	57 58 57 62 67 61 65 63
Plate, 1/4-3/4" (6.4-19.1mm) thick***	Room 200(93) 400(204) 600(316) 800(427) 1000(538) 1200(649) 1400(760)	114 107 98 95 92 88 85 76	54 49 41 36 35 34 32 31	62 65 66 68 68 67 69 68
Bar, 1/2-2" (12.7-50.8mm) diameter****	Room 200(93) 400(204) 600(316) 800(427) 1000(538) 1200(649) 1400(760)	111 105 96 92 89 84 80 72	52 45 38 34 31 29 28 29	70 73 74 79 79 80 80 77

Ksi can be converted to MPa (megapascals) by multiplying by 6.895.

\*\*Average of 10-20 tests.

\*\*\*Average of 16-32 tests.

\*\*\*\*Average of 8-16 tests.

H.P. Alloys

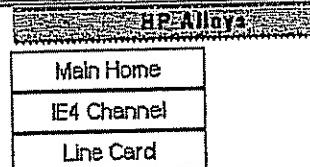
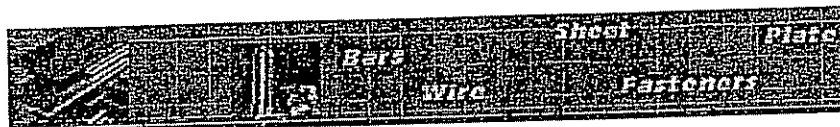
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### Fabrication

C-22 can easily be cold-worked because of its ductility and cold-forming is the preferred method of forming. More energy is required because the alloy is generally stiffer than austenitic stainless steels. 0.28" thick sheet in the heat-treated at 2050°F, rapid quenched condition, has an average Olsen cup depth of 0.49".

### Welding

It is proven to possess excellent weldability and high corrosion resistance as consumable filler wires and electrodes. The alloy has proven results as a filler wire in many applications. As filler wire use when other corrosion resistant wires have failed.

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September 12, 2005

**VIA FACSIMILE AND FIRST CLASS MAIL**

Russell W. Kirchner, President  
 High Performance Alloys, Inc.  
 444 Wilson Street  
 Tipton, IN 46072

**Re: Use of Haynes Trademarks**

Dear Mr. Kirchner:

We represent Haynes International, Inc. As you know, Haynes has several registered trademarks for the metal alloys that you purchase from Haynes and re-sell to your customers. The marks are listed on the enclosed report from the United States Patent and Trademark Office. While you may use Haynes' trademarks in conjunction with the sale of products that you purchase from Haynes, any use of Haynes' trademarks should indicate that the trademarks you use are trademarks of Haynes International. In addition, you may not offer to sell a product under a Haynes trademark and then substitute an alloy from another manufacturer when an order is received.

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*We have initiated  
 A program to make these  
 necessary changes.  
 Russ Kirchner  
 President  
 9/28/05*

**Buchanan Ingersoll PC**

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September 12, 2005

**VIA FACSIMILE AND FIRST CLASS MAIL**

Jay P. Fregeau, President/CEO  
 Instrument Associates, Inc.  
 4839 W. 128th Place  
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**Re: Use of Haynes Trademarks**

Dear Mr. Fregeau:

We represent Haynes International, Inc. As you know, Haynes has several registered trademarks for the metal alloys that you purchase from Haynes and re-sell to your customers. The marks are listed on the enclosed report from the United States Patent and Trademark Office. While you may use Haynes' trademarks in conjunction with the sale of products that you purchase from Haynes, any use of Haynes' trademarks should indicate that the trademarks you use are trademarks of Haynes International. In addition, you may not offer to sell a product under a Haynes trademark and then substitute an alloy from another manufacturer when an order is received.

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September 12, 2005

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If you have any questions or concerns, please call me.

Very truly yours,



Lynn J. Alstadt

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Nickel Alloys	200, 400, 600, 601, 625, 800HT, C.276, C-22, Alloy 20	Pipe Sizes from: 1/8" NPS to 8" NPS Schedules from: 10 to 80
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Material	Grade/Alloy	Size Ranges
Aluminum Alloys	2024, 3003, 5052, 6061, 6063, 7075, Seamless, Extruded, Squares, Rectangles, Structural, Ornamentals	Outside Diameters: 1/8" to 12" Wall thickness' from .020 to 1.000"
Stainless Steel	303, 304, 304L, 316, 316L, 321, 347, PH grades, Seamless, Welded and Drawn, As welded, instrumentation, Squares, Rectangles, Polished, Sanitary, Hypodermic	Outside Diameters .009" to 10" Wall thickness' from .0025 to 2.000"
Nickel Alloys	200, 400, 600, 601, 625, 800H, 825, C.276, C-22, Alloy 20	Outside Diameters .009" to 10" Wall thickness' from .0025 to 2.000"
Titanium	CP, 3AL - 2.5V, Ducting	Outside Diameters from 1/4" Wall thickness' from .020"
Alloy	4130, 4340, 8620, 52100, Squares, Rectangles, Streamline	Outside Diameters: 3/16" to 10" Wall thickness'

HE 00780

EC 0288

3/10/2005

		from .028" to 1.000"
Carbon	Low Carbon 1020, 1026, DOM, Seamless, As Welded, Hydraulic, Mechanical, Aircraft, Structural Shapes	Outside Diameters: .125" to 16" Wall thickness' from .020" to 3"

C-ZZ is a registered trademark of Hayes International, Inc.

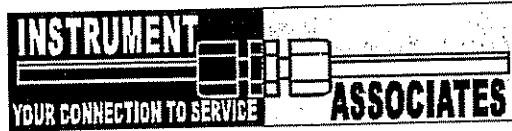
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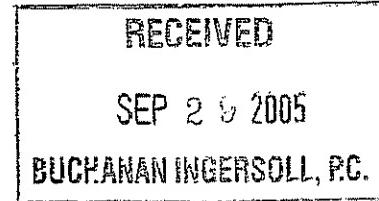


HE 00781

EC 0289



4839 West 128<sup>th</sup> Place • Alsip, Illinois 60803  
Phone: (708) 597-9880 • Fax: (708) 597-1608  
website: [www.instrumentassociates.com](http://www.instrumentassociates.com)  
email: [sales@instrumentassociates.com](mailto:sales@instrumentassociates.com)



Lynn Alstadt  
Buchanan Ingersoll PC  
One Oxford Centre  
301 Grant Street, 20<sup>th</sup> Floor  
Pittsburgh, PA 15219-1410

Re: Use of Haynes Trademarks

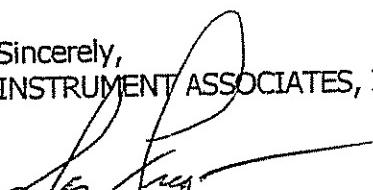
Dear Lynn,

I am in receipt of your letter dated September 12, 2005 regarding the use of the Haynes Trademark on our website. We have reviewed our website and all references to Haynes C-22 trademark have been removed. Our website was the only place where the C-22 trademark was used.

I apologize for this oversight and will contact either you or Paul Manning prior to any publication using Haynes products or trademarks.

If you need any additional information or clarification, please do not hesitate to contact me.

Sincerely,  
INSTRUMENT ASSOCIATES, INC.

  
Jay P. Fregeau  
President / CEO

## Instrument Associates, Inc. - YOUR CONNECTION TO SERVICE

### TW Metals Tube Products

Material	Grade/Alloy	Size Ranges
Aluminum Alloys	2024, 3003, 5052, 6061, 6063, 7075, Seamless, Extruded, Squares, Rectangles, Structural, Ornamentals	Outside Diameters: 1/8" to 12" Wall thickness' from .020 to 1.000"
Stainless Steel	303, 304, 304L, 316, 316L, 321, 347 ,PH grades, Seamless, Welded and Drawn, As welded, instrumentation, Squares, Rectangles, Polished, Sanitary, Hypodermic	Outside Diameters .009" to 10" Wall thickness' from .0025 to 2.000"
Nickel Alloys	200, 400, 600, 601, 625, 800H, 825, C276, Alloy 20	Outside Diameters .009" to 10" Wall thickness' from .0025 to 2.000
Titanium	CP, 3AL - 2.5V, Ducting	Outside Diameters from 1/4" Wall thickness' from .020"
Alloy	4130, 4340, 8620, 52100, Squares, Rectangles, Streamline	Outside Diameters: 3/16" to 10" Wall thickness' from .028" to 1.000"
Carbon	Low Carbon 1020, 1026, DOM, Seamless, As Welded, Hydraulic, Mechanical, Aircraft, Structural Shapes	Outside Diameters: .125" to 16" Wall thickness' from .020" to 3"

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HE 00783

## Instrument Associates, Inc. - YOUR CONNECTION TO SERVICE

### TW Metals Pipe Products

Material	Grade/Alloy	Size Ranges
Aluminum Alloys	6061-T6, 6063-T6, 5086, Seamless, Extruded, Construction Grades	Pipe Sizes from: 1/4" NPS to 12" NPS Schedules from: 10 to 80
Stainless Steel	304, 304L, 316, 316L, 321, 347, 446, Seamless, Welded, As Welded, Brewery Quality	Pipe Sizes from: 1/8" NPS to 24" NPS Schedules from: 5 to 120
Nickel Alloys	200, 400, 600, 601, 625, 800HT, C276, Alloy 20	Pipe Sizes from: 1/8" NPS to 8" NPS Schedules from: 10 to 80
Carbon	Line Pipe, Lacquered, Structural	Pipe Sizes from: 1/8" to 12" Schedules from: 5 to 80

For more information, please *contact us*.

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HE 00784

**Buchanan Ingersoll PC**

ATTORNEYS

Lynn J. Alstadt  
412 562 1632  
alstadtlj@bipc.com

One Oxford Centre  
501 Grant Street, 20th Floor  
Pittsburgh, PA 15219-1410  
T 412 562 8800  
F 412 562 1041  
www.buchananingersoll.com

September 12, 2005

**VIA FACSIMILE AND FIRST CLASS MAIL**

J. M. Carty, Inc.  
6100 Donner Road  
Buffalo, New York 14094

Re: Use of Haynes Trademarks

Gentlemen:

We represent Haynes International, Inc. As you may know, Haynes has several registered trademarks for the metal alloys that you purchase from Haynes and re-sell to your customers. The marks are listed on the enclosed report from the United States Patent and Trademark Office. While you may use Haynes' trademarks in conjunction with the sale of products that are made from alloys purchased from Haynes, any use of Haynes' trademarks should indicate that the trademarks you use are trademarks of Haynes International. In addition, you may not offer to sell a product under a Haynes trademark and then substitute an alloy from another manufacturer when an order is received.

Enclosed is a copy of two product brochures available on your company website in which Haynes' C-22 trademark is used incorrectly. We, therefore, ask that you immediately make the corrections described below and noted in red on the enclosed copies.

There should be a dash between the letter and number. The ® designation should appear as a superscript adjacent to the end of each trademark. This designation should be used everywhere the registered mark appears. There should also be a line added that says: "C-22 is a registered trademark of Haynes International, Inc."

Continued use of the enclosed brochures in which the Haynes trademarks appear without being identified as such constitutes misuse of Haynes trademarks. If such misuse continues Haynes will be required to take legal action against your company to stop the misuse or lose valuable trademark rights. It is our hope that you will make the requested changes so that Haynes is not forced to choose between suing a customer or losing its trademark rights.

Please tell me by September 30, 2005, whether you will change your product brochures and if so, when the change will be made.

HE 00785

September 12, 2005

Page - 2 -

Should you decide to use any Haynes trademarks in any future brochures, web pages or advertisements, I suggest that you send a draft to me or Paul Manning at Haynes International for review before the brochure or advertisement is published. We will promptly review your publication and correct any incorrect use of a Haynes trademark.

If you have any questions or concerns, please call me.

Very truly yours,



Lynn J. Alstadt

LJA/bem

Enclosures

cc: Paul Manning (w/encl.)

HE 00786



United States Patent and Trademark Office

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## Trademarks &gt; Trademark Electronic Search System(Tess)

TESS was last updated on Sat Sep 10 04:12:50 EDT 2005


 Please logout when you are done to release system resources allocated for you.

  OR 

**23 Records(s) found (This page: 1 ~ 23)**

 (Haynes)[ON] and (International)[ON] not (S) 

Current Search: S4: (Haynes)[ON] and (International)[ON] not (Seasol)[ON] and (live)[LD] docs: 23 occ: 71

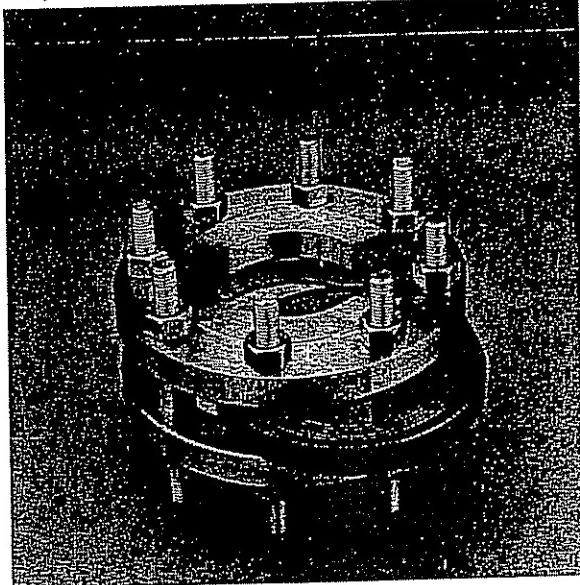
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1	76442604	2816268	556	TARR	LIVE
2	76434700		282	TARR	LIVE
3	76423154	2785667	D-205	TARR	LIVE
4	76423153	2755568	230-W	TARR	LIVE
5	76423152	2752325	214	TARR	LIVE
6	76423151	2752324	242	TARR	LIVE
7	76400933	2832716	G-35	TARR	LIVE
8	76400932		C-22HS	TARR	LIVE
9	75646170	2532561	625SQ	TARR	LIVE
10	75047108	2023945	HR-120	TARR	LIVE
11	74697077	1982521	230	TARR	LIVE
12	74697076	2002631	C-2000	TARR	LIVE
13	74673214	2063855	B-3	TARR	LIVE
14	74174760	1717465	HR-160	TARR	LIVE
15	74168140	1711142	G-50	TARR	LIVE
16	74023771	1742719	ULTIMET	TARR	LIVE
17	73701791	16D0332	G-30	TARR	LIVE
18	73701790	1953864	C-22	TARR	LIVE
19	72159440	0759676	MULTIMET	TARR	LIVE
20	72157340	0756690	MULTIMET	TARR	LIVE
21	71667590	0605011	HASTELLOY	TARR	LIVE
22	71586534	0566221	HAYNES	TARR	LIVE
23	71292933	0269898	HASTELLOY	TARR	LIVE

HE 00787

**CANTY**

PROCESS TECHNOLOGY

## QUICK CHANGE RUPTURE DISK HOLDER



### THE CANTY ADVANTAGE

The Canty Quick Change Rupture Disk allows a single rupture disk user to quickly change, inspect, or clean a rupture disk. This allows increased safety and proper Clean-In-Place standards to be maintained simultaneously. The Quick Change Rupture Disk (QCRD) requires no tools to install and relies on a dual floating o-ring seal. This patented seal ring arrangement is identical to the Canty Quick Ports for access, view, and sample ports.

The zero leak design has been proven through a combination of air and liquid submergence testing. This takes the Quick Port through external pressure, no pressure, and ultra high internal pressure leak testing where a constant o-ring seal was maintained.

The QCRD integrity is guaranteed through its simple seal ring design, which deflects as the rupture disk is inserted. The original seal ring concept has over 20 years of experience in the hyperbaric and diving industry where any operational failure would be fatal.

### APPLICATIONS

- Rupture disc replacement in under one minute by a single operator
- Rupture disk inspection
- Facilitates changing disks under relief valves or in difficult areas
- Easily allows disc cleaning (Please consult disk manufacturer for procedure)
- Many, many more!

### SPECIFICATIONS

- ANSI 150 lb., 300 lb., and 600 lb. mount
- DIN 10 bar, 16 bar, and 40 bar mount
- Stainless steel, Carbon steel, Hastelloy, or Teflon® construction
- Meets ASME, BS5500, and EC Codes (see interlock options) for quick opening closures
- Code material test reports available
- Designed to interface with ZOOK graphite rupture disks or equivalent and various pretorqued metal disk holders

### OPTIONS

- Limit switch to indicate presence or absence of disc
- Pressure interlocks (Not required for code steel)
- Pressurized seal ring interconnected
- Custom sizes or pressures available
- Almost any material of construction is available

JM.CANTY.JNC.

Buffalo, NY USA

Ph:(716) 625 - 4227

Fax:(716) 625 - 4228

JM.CANTY.LTD.

Dublin, Ireland

Ph: +353 (01) 459 8808

Fax:+353 (01) 462 5133

[sales@jmcanty.com](mailto:sales@jmcanty.com)

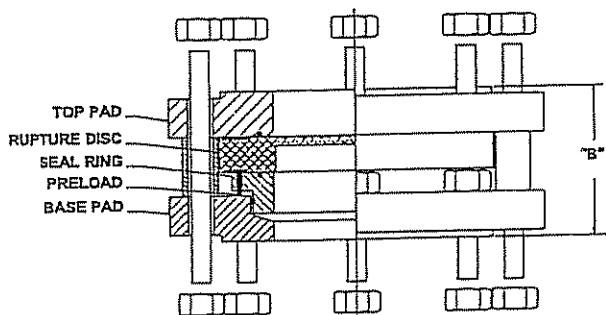
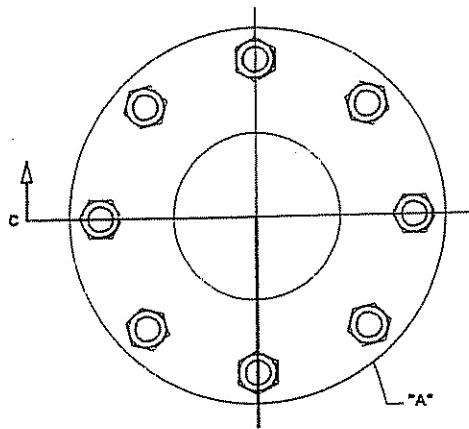
Document #96B6525 Rev. 0121099

Represented by:

HE 00788

EC 0277

## DIMENSIONAL INFORMATION



SECTION C-C

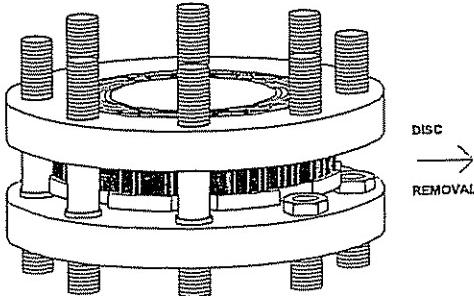
As illustrated, the rupture disc holder uses a seal ring which applies an initial force to the disc via the stainless steel preload. Once pressure or vacuum is applied to the rupture disc the floating seal ring adds additional force to seal the disc. When a disc is blown you simply remove it by sliding it out from the holder through the open slot. A replacement can then easily be pushed back into place and the process restarted.

VARIABLE DIMENSION SPECIFICATIONS / 150 lb				
SIZE	-A-	-B-	PRESSURE RATING	• MAXIMUM TEMPERATURE
2"	6.00	2.95	290 PSI	450 F
3"	7.50	3.33	290 PSI	450 F
4"	9.00	3.33	250 PSI	450 F
6"	11.00	3.45	170 PSI	450 F
8"	13.50	3.95	170 PSI	450 F
10"	16.00	4.45	150 PSI	450 F

VARIABLE DIMENSION SPECIFICATIONS / 300 lb				
SIZE	-A-	-B-	PRESSURE RATING	• MAXIMUM TEMPERATURE
2"	6.50	3.33	400 PSI	450 F
3"	8.25	4.08	400 PSI	450 F
4"	10.00	4.33	400 PSI	450 F
6"	12.25	5.20	350 PSI	450 F
8"	15.00	6.08	300 PSI	450 F

VARIABLE DIMENSION SPECIFICATIONS / 600 lb				
SIZE	-A-	-B-	PRESSURE RATING	• MAXIMUM TEMPERATURE
2"	6.50	3.58	600 PSI	450 F
3"	8.25	4.33	600 PSI	450 F

- TEFLO<sup>®</sup> SEALRING IS ONLY RATED TO 300F.
- TEMPERATURE IS DEPENDENT ON O-RING MATERIAL
- "B" DIMENSIONS ARE FOR ZOOK GRAPHITE DISCS OR EQUIVALENT
- CONSULT FACTORY FOR DIN DIMENSIONS



HOW TO ORDER: Select the appropriate symbols and build a model number as shown:

EXAMPLE:

SS-4-QCRD150-SS-VOR-SN-GDISC

WETTED MATERIAL (PROCESS SIDE)

SS = 316L STAINLESS STEEL

CS = CARBON STEEL

C276 = ALLOY C276

G22 = ALLOY G22 C-22

TEF = TEFLO<sup>®</sup>

SIZE

ANSI - 2", 3", 4", 6", 8", 10"

DIN - 50, 80, 100, 150, 200, 250 mm

PRESSURE

ANSI

150 = 150 PSI

300 = 300 PSI

600 = 600 PSI

DIN

10 = 10 BAR

16 = 16 BAR

40 = 40 BAR

DISC OPTION (NOT INCLUDED)

GDISC = GRAPHITE DISC

MDISC = METAL DISC

SEAL RING OPTIONS

SN = STANDARD

SP = SELF PRESSURIZED

O-RING MATERIAL

BOR = BUNA-N

VOR = VITON

SOR = SILICONE

EOR = EPDM

NOR = NEOPRENE

WETTED MATERIAL (VENT SIDE)

SS = 316L STAINLESS STEEL

CS = CARBON STEEL

C276 = ALLOY C276

G22 = ALLOY G22

TEF = TEFLO<sup>®</sup>

Teflon<sup>®</sup> is a registered trademark of the DuPont Corporation.

C-22 is a registered trademark of Haynes International, Inc.

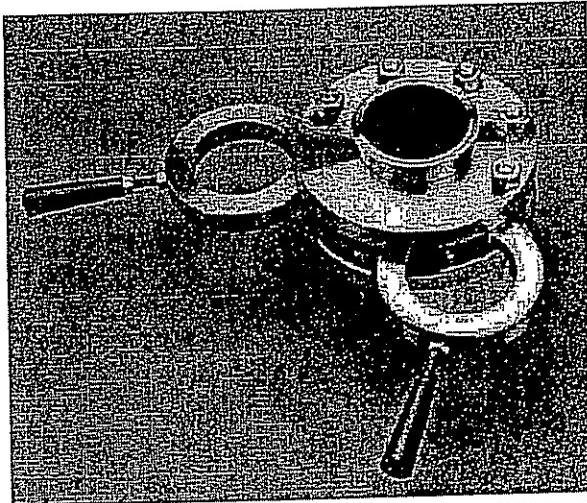
HE 00789

EC 0278

# CANTY

PROCESS TECHNOLOGY

## QuickFill View Port Applications Sheet



### HOW IT WORKS

The Canty QuickPort is a patented, safe, quick opening closure for process vessels. Originally used in the offshore diving industry as a transfer lock on decompression chambers, Quickports are used with no additional interlock by various non-industrial personnel in applications where any operational failure would be fatal.

The zero leak design has been proven through a combination of air and liquid submergence testing. This cycles the QuickPort through external pressure, no pressure and ultra high internal pressure leak testing where a constant o-ring seal was maintained.

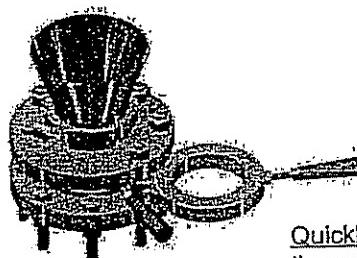
### FEATURES

- No Bolting or Torquing required
- Zero Leak Closure
- Full Vacuum
- ANSI 150 lb., 300 lb., and 600 lb. Mount
- DIN 10 bar, 16 bar, and 40 bar mount
- 316L Stainless Steel, Teflon, Alloy C276, or C22 construction.
- Meets ASME, BS5500, and EC codes (see interlock options) for quick opening closures.

### APPLICATIONS

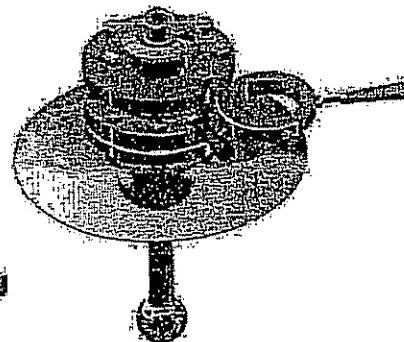
- Vessel Charging
- Vessel Sampling
- Powder Addition
- Test Vessels
- Quick Change Filter
- Dec Powder Transfer System a De Dietrich exclusive In North America
- ILC Dover - Dover Pac® System
- Process View Port
- Sprayball Attachment

#### Vessel charging with clamp on or drop in funnel

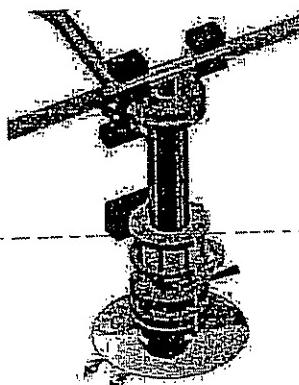


- Inexpensive option for non-hazardous chemical addition
- Prevents spills
- Quick to install

#### Quickly attach a sprayball without the need for an additional nozzle

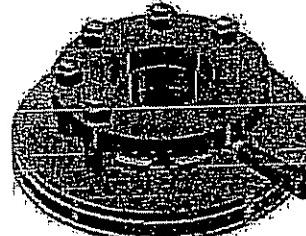


#### Vessel charging with Dec PTS system



- Maximizes nozzle use:
- Sight glass
- Charge port
- Spray nozzle port
- Light port

#### Vessel charging and sampling with Dover Pac® charging system



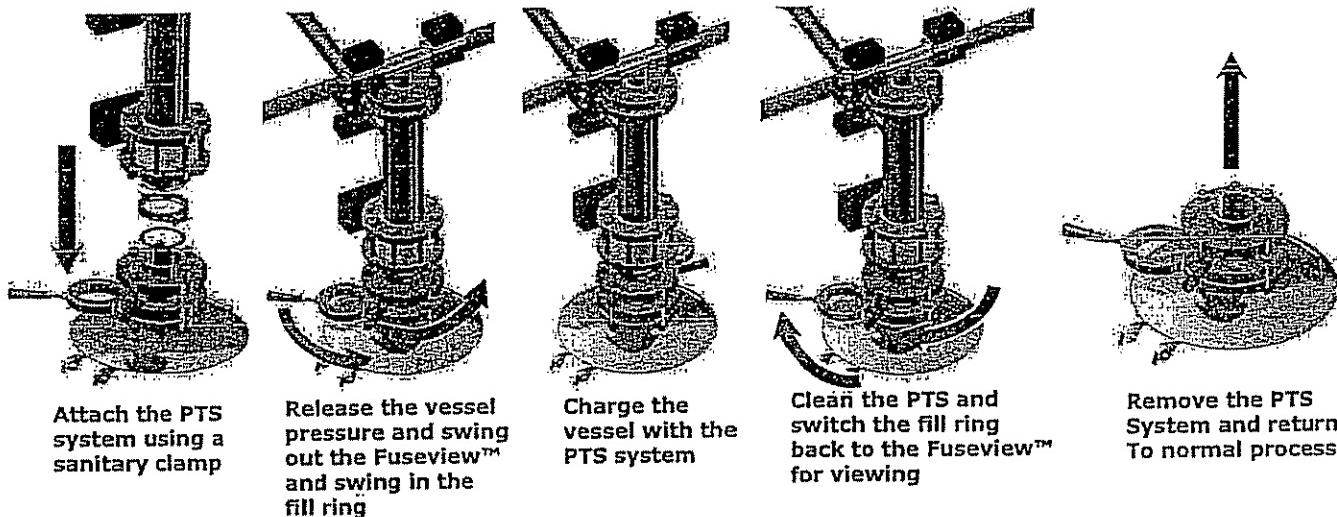
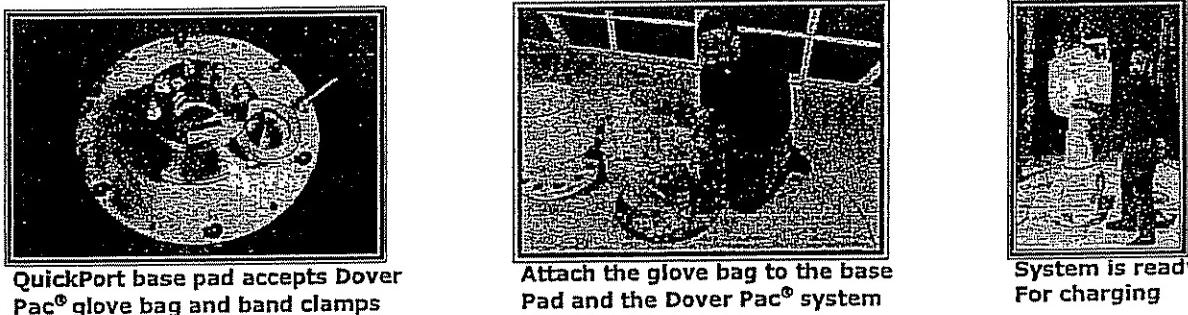
- Easy to use
- Full pressure and vacuum rated
- Easily cleaned
- Minimizes space requirements
- Allows the use of standard Dover Pac® parts.

**CANTY**
JM Canty Inc  
JM Canty Intl LtdBuffalo, NY USA  
Dublin, IrelandPh: (716) 625 4227  
Ph: +353 (01) 882 9621Fax: (716) 625 4228  
Fax: +353 (01) 882 9622

www.jmcanty.com

HE 00790

EC 0279

**QuickFill Port Used with Dec PTS(Powder Transfer System)****QuickFill Port Used with a Dover Pac® Charging System****Ordering Information**

HOW TO ORDER: Select the appropriate symbols and build a model number as shown:

**EXAMPLE: SS-4-QFVP150-SS-VOR-SN-4"TRI**

WETTED MATL:

SS - 316L S.S.

C276 - ALLOY C276

C-22<sup>®</sup> C22 - ALLOY C22 C-22<sup>®</sup>

TEF - TEFLON<sup>®</sup>

SIZE:

2", 3", 4", 6", 8", 10"

50, 80, 100, 150, 200, 250 mm

MODEL:

QFVP - QUICKFILL VIEW PORT  
QVPTS - QUICK VIEW PORT™ TO  
ACCEPT DEC PTS

QVPAC - QUICK VIEW PORT™ TO  
ACCEPT DOVER PAC<sup>®</sup>

Pressure:

150, 300, 600 psi

10, 16, 40 bar

**CANTY**

JM Canty Inc  
JM Canty Intl Ltd

Buffalo, NY USA  
Dublin, Ireland

Ph: (716) 625 4227  
Ph: +353 (01) 882 9621

Fax: (716) 625 4228  
Fax: +353 (01) 882 9622

TEFLON<sup>®</sup> is a registered trademark of DuPont Corporation

Dover Pac<sup>®</sup> is a registered trademark of the ILC Dover Corporation

C-22 is a registered trademark of  
Haynes International, Inc.

J M C A N T Y, I N C .

RECEIVED

SEP 22 2005

BUCHANAN INGERSOLL, P.C.

September 19, 2005

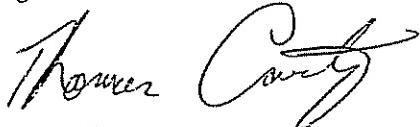
Buchanan Ingersoll PC  
One Oxford Centre  
301 Grant Street, 20<sup>th</sup> Floor  
Pittsburgh, Pennsylvania 15219

Re: Use of Haynes Trademarks

Dear Ms Lynn Alstadt:

We have read your letter and looked into the use of C22 in our literature. It is true that we do buy hastelloy from Haynes but they are not our only supplier. We use the industry accepted name C22 in our literature. If Haynes was our only and exclusive supplier then we would use the C-22 registered trademark. But to use it at this time it would be false advertising since we also use other sources.

Regards,



Thomas Carty  
President

**Buchanan Ingersoll PC**

ATTORNEYS

Lynn J. Alstadt  
 412 562 1632  
 alstadtlj@bjpc.com

One Oxford Centre  
 301 Grant Street, 20th Floor  
 Pittsburgh, PA 15219-1410  
 T 412 562 8800  
 F 412 562 1041  
 www.buchananingersoll.com

October 6, 2005

**VIA FACSIMILE AND FIRST CLASS MAIL**

Thomas Canty  
 J. M. Canty, Inc.  
 6100 Donner Road  
 Buffalo, New York 14094

**Re: Use of Haynes Trademarks**

Dear Mr. Canty:

I received your letter of September 19, 2005, concerning use of C22. I understand from that letter that your company intends to continue using C22 for an alloy composition that you purchase from Haynes and for alloy compositions that you purchase from other alloy manufacturers.

I have attempted to reach you by telephone but you have not returned my call. In my last message to you I told your secretary that C-22 is a registered trademark of Haynes International and that any use of C22 violates Haynes trademark rights. I also told her that Haynes currently has a lawsuit pending against Ellectralloy who has used C22, EC22 and GOEC22 for an alloy composition that is similar to Haynes C-22 alloy and within UNS NO6022. Since the lawsuit was filed Ellectralloy appears to have stopped using C22. Unless your company immediately ceases its use of C-22 Haynes will institute a lawsuit against your company to stop such use. Indeed, Haynes has already authorized me to prepare the complaint.

In your letter you say, "We use the industry accepted C22 in our literature." However, there is no manufacturer of alloy products who currently uses C22 as a designation for an alloy composition that it makes. Special Metals uses INCONEL 622 for its alloy within UNS NO6022. Allegheny Technologies uses Nickelvac 22. These companies and others have also used Alloy 22 for this composition. Haynes has no objection to the use of Alloy 22 for compositions within UNS NO6022.

HE 00793

October 6, 2005

Page - 2 -

I write to give you one last opportunity to reconsider your position concerning the use of C22. If I do not receive prompt written assurance from you that your company has ceased using C22, legal action may be initiated without further notice.

Very truly yours,



Lynn J. Alstadt

LJA/bem

cc: Paul Manning

HE 00794

Alstadt, Lynn

From: Paul Manning [pmanning@haynesintl.com]  
Sent: Friday, September 09, 2005 12:31 PM  
To: marphil.int@wanadoo.fr; Alstadt, Lynn  
Subject: Legal Issue

Attachments: Fw: Marphil



Fw: Marphil

As is mentioned in correspondence below we observed your recent ad in Stainless Steel World where you used the term C22 as one of your nickel alloys. This email is to inform you that C-22® alloy is a registered trademark of Haynes International Inc. and Haynes is very serious in protecting its trademark rights. It is possible that some alloy you sell was made by Haynes, in which case the use as indicated above is required with a footnote stating it is a registered trademark of Haynes International. If the product you sell is a mix of many manufacturers of this alloy (UNS number N06022) then you can call it some other name, although many call it alloy 22. Similar letters have been written to CMI, which is where you may have purchased some material made by Haynes, who have been likewise put on notice for improper use of Haynes trademark by our outside law firm.

Please reply that you plan to take steps to remedy this issue as our next contact will be through our outside legal representative. Thank you for your attention to this matter.

Regards

Paul Manning  
Director of Marketing

HE 00795

Alstadt, Lynn

---

**From:** Paul Manning [pmanning@haynesintl.com]  
**Sent:** Tuesday, September 13, 2005 8:44 AM  
**To:** f.tilkens@wanadoo.fr; Alstadt, Lynn  
**Subject:** Re: Legal issue - Marphil's ad

Thank you very much for your response to this issue. We very much appreciate it.

Regards

Paul Manning

Florence TILKENS wrote:

Dear Mr Manning,

We refer to your e-mail of 9th September regarding Marphil International's ad in Stainless Steel World.

We confirm that KCI (Stainless Steel World) has been contacted to make the appropriate amendments to our ad , ie to

suppress "C" in the mention of the alloy 22 supplied by Marphil International.

We know about "Hastelloy" being a registered trademark of Haynes International Inc. and therefor never use it in the description of our alloy-22 products as they originate from different manufacturers. We did not know about "C 22" . Please accept our apologies.

We remain at your service should you require any further information.

Best regards

Florence Tilkens

*Marphil International*

*36 rue de Richelieu*

*75001 Paris*

*France*

HE 00796

**Buchanan Ingersoll PC**

ATTORNEYS

Lynn J. Alstadt  
412 562 1632  
alstadtlj@bjpc.com

One Oxford Centre  
301 Grant Street, 20th Floor  
Pittsburgh, PA 15219-1410  
T 412 562 8800  
F 412 562 1041  
www.buchananingersoll.com

September 13, 2005

**VIA FACSIMILE AND FIRST CLASS MAIL**

Mr. Lane Cobden, President  
National Specialty Alloys, Inc.  
18250 Keith Harrow Boulevard  
Houston, Texas 77084

**Re: Use of Haynes Trademarks**

Dear Mr. Cobden:

We represent Haynes International, Inc. As you know, Haynes has several registered trademarks for the metal alloys that you purchase from Haynes and re-sell to your customers. The marks are listed on the enclosed report from the United States Patent and Trademark Office. While you may use Haynes' trademarks in conjunction with the sale of products that you purchase from Haynes, any use of Haynes' trademarks should indicate that the trademarks you use are trademarks of Haynes International. In addition, you may not offer to sell a product under a Haynes trademark and then substitute an alloy from another manufacturer when an order is received.

Enclosed is a copy of your web pages in which Haynes' registered trademark C-22 is used incorrectly. We, therefore, ask that you immediately make the corrections described below and noted in red on the enclosed copies.

The ® designation should appear as a superscript adjacent to the end of each trademark. This designation should be used everywhere the registered mark appears. There should also be a line added that says: "C-22 is a registered trademark of Haynes International, Inc."

Continued use of the enclosed web pages or any brochures in which the Haynes trademarks appear without being identified as such constitutes misuse of Haynes trademarks. If such misuse continues Haynes will be required to take legal action against your company to stop the misuse or lose valuable trademark rights. It is our hope that you will make the requested changes to those web pages so that Haynes is not forced to choose between suing a customer or losing its trademark rights.

Please tell me by September 30, 2005, whether you will change your web pages and, if so, when the change will be made.

HE 00797

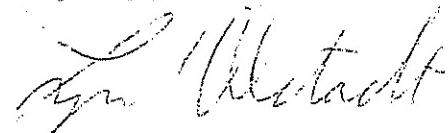
September 13, 2005

Page - 2 -

Should you decide to use any Haynes trademarks in any future web pages, brochures or advertisements, I suggest that you send a draft to me or Paul Manning at Haynes International for review before the web page, brochure or advertisement is published. We will promptly review your publication and correct any incorrect use of a Haynes trademark.

If you have any questions or concerns, please call me.

Very truly yours,



Lynn J. Alstadt

LJA/bem

Enclosures

cc: Paul Manning (w/encl.)

HE 00798



United States Patent and Trademark Office

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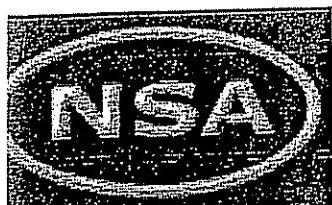
  At:
OR  to record:
**23 Records(s) found (This page: 1 ~ 23)**
 (Haynes)[ON] and (International)[ON] not ( Submit)

Current Search: S4: (Haynes)[ON] and (International)[ON] not (Seasol)[ON] and (live)[LD] docs: 23 occ: 71

	Serial Number	Reg. Number	Word Mark	Check Status	Live/Dead
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2	76434700		282	TARR	LIVE
3	76423154	2785667	D-205	TARR	LIVE
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23	71292933	0269898	HASTELLOY	TARR	LIVE

HE 00799

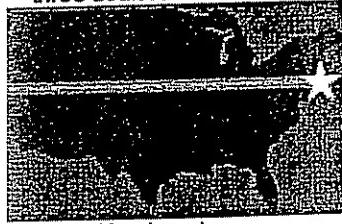
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roudly serving the United States and international markets from three dedicated locations.



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PH: 800.847.5653  
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Houston, TX 77084  
281-345-2115

Canada and Puerto Rico:  
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Mexico Voice Toll-Free:  
001.888.219.6854

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1171 Armando St.  
Anaheim, CA. 92806  
PH: 800.342.7797

East Coast  
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Suwanee, GA. 30024  
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- ISO 9001 Certification
- Send Me a Brochure
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**Nickel & Special Alloys****Bars, Shapes, Forgings, Castings  
From Inventory or Mill Orders**

1"	1-1/4"	1-1/2"	1-3/4"
2"	2-1/4"	2-1/2"	2-3/4"
3"	3-1/4"	3-1/2"	3-3/4"
4"	4-1/4"	4-1/2"	4-3/4"
5"	5-1/2"		
6"	6-1/2"		
7"	7-1/2"		
8"	8-1/2"		
9"	9-1/2"		
10"			

Per AMS - ASTM - QQS Specifications

• Nickel 405 is also available in hex, 1/2" thru 2"

Nickel and other special alloys are used in aerospace, marine, chemical, petrochemical, oil and gas, waste processing, and power generation industries. Please call us on any hard-to-find-items.

Special Alloys	Nickel Alloys
Titanium	Nickel Alloy 200
Tungsten	Nickel Alloy 400
Vanadium	Nickel Alloy 405
A-286	Nickel Alloy 600
L-605	Nickel Alloy 625
C-22(R)	Nickel Alloy 718
C-276	Nickel Alloy K-500
Alloy 20	800
904L	800 HT
35N	825
	718 HT

C-22 is a registered trademark of Haynes International, Inc.

Call NSA on any size, shape and alloy that is not listed.

**Steel Bar Specification**

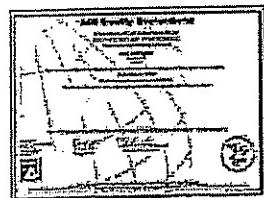
TYPE	AMS	ASTM	FEDERAL	CHARACTERISTICS
302	5636	A276	QQ-S-763	Basic, general purpose type with good corrosion resistance and mechanical properties.
	5637	A313		
	5637	A314		
	5638	A479		
	5638	A493		
	5638	A580		
302B		A276		Similar to Type 302 but Si improves resistance to oxidation.
		A314		
		A580		
303	5640	A314		Resistant to atmospheric corrosion resistance with improved mechanical properties.
	5640	A320		
	5640	A581		
	5640	A582		
XM-19		A276		Nitrogen strengthened austenitic, good corrosion resistance with improved mechanical properties.
		A479		
		A580		
304	5639	A182	QQ-S-763	Low carbon variation of

TYPE	AMS	ASTM	FEDERAL	CHARACTERISTICS
347F	5642			Free-machining variation of Type 347
Se				
348		A182		Similar to type 347 but Ta reduced
		A276		
		A314		
		A320		
		A479		
		A580		
403	5614	A276	QQ-S-763	Special high quality variation of type 410 highly stressed parts
	5614	A314		
	5614	A580		
405		A276	QQ-S-763	
		A314		
		A580		
410	5612	A182	QQ-S-763	Low cost general purpose stainless steel
	5613	A193		Wide use where
	5776	A276		corrosion is not severe
		A314		
		A479		

HE 00800

EC 0343

5



National Speciality Alloys is  
 ISO 9001 certified to assure our  
 customers of the highest quality  
 in product and service.

		A193 A276 A313 A320 A479 A493 A580		Type 302, minimizes carbide precipitation during welding.		A493 A580		
304L	5647	A182 A276 A314 A479 A580	QQ-S-763	Extra-low carbon content eliminates harmful carbide precipitation during welding.	414	5615	A276 A314 A580	QQ-S-763
305	5685	A276 A313	QQ-S-763	Low work-hardening rate, good spinning, deep-drawing, and cold-heading characteristics.	416	5615	A314 A581 A582	
	5686	A314 A580			420	5621	A276 A314 A580	QQ-S-763
308		A276 A314 A580		High Cr and Ni produce good heat/corrosion resistance. Used widely for welding rod.	420F	5620		Free-machining vari of Type 420
309		A276 A314 A580	QQ-S-763	High strength and resistance to scaling at high temperatures.	420 F Se	5620		Similar to Type 420 For forging.
309S	5650	A276 A314 A580		Similar to Type 309 but carbon lowered to minimize carbide precip, and improve weldability. Welding wire.	422	5655	A565	
310	5651	A182 A276	QQ-S-763	Higher alloy content improves basic characteristics of Type 309	430	5627	A276 A314 A479 A493 A580	QQ-S-763
	5694	A314 A580			430F		A314 A581 A582	
310S		A276 A314 A479 A580		Similar to Type 310 but carbon lowered to minimize carbide precip. And improve weldability. Welding wire.	431	5628	A276 A314 A580 A493	
314	5652	A271 A314 A580		Si increased to further improve scaling resistance	440A	5631	A276 A314 A580	QQ-S-763
316	5648 5690	A182 A193 A276 A313 A314 A320 A479 A493 A580	QQ-S-763	Mo improves general corrosion and pitting resistance and high temperature strength.	440B		A276 A314 A580	QQ-S-763
316L	5653	A182 A276 A314 A479 A580	QQ-S-763	Extra low carbon version of Type 316. Eliminates harmful carbide precipitation due to welding.	440C	5630	A276 A314 A493 A580	QQ-S-763
317		A276 A314 A580	QQ-S-763	Higher alloy content improves basic advantages of Type 316	440F	5632		Free-machining vert of Type 440C
317L		A182	QQ-S-763	Extra low carbon variation of T-317 for welded structures.	44DF Se	5632		
321	5645 5689	A182 A193 A276 A314 A320 A479 A493	QQ-S-763	Stabilized to permit use in 800-1500 F range without harmful carbide precipitation.	445		A276 A314 A580	QQ-S-763
					17-4 PH	5622 5643	A564	Combines excellent corr. resist., high strength and hardness low temp. hardening and good fabricating characteristics.
					15-5	5856	A564	Similar to 17-4 PH b

		A580 A180						superior transverse ductility and toughness
347	5646	A182 A193 A276 A314 A320 A479 A493 A580	QQ-S-763	Characteristics similar to Type 321. Stabilized by Cb and Ta.				Special high strength stainless similar to F 15-7 Mo but with high toughness.
								Similar to 17-7 PH b with higher strength.
								Excellent transverse properties. Has superior strength and toughness.

**Products:**

Stainless Pump Shaft Quality | Nickel & Special Alloy | Nitroncs | Duplex | Nickel Pump Shaft Quality

18250 Keith Harrow Blvd Houston, TX 77084

toll free 800-847-5653 • Tel: 281-345-2115 • fax 281-345-1133 • email: sales@nationalspecialty.com

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HE 00802

EC 0345

Alstadt, Lynn

From: Charles Dawson [cdawson@nationalspeciality.com]  
Sent: Wednesday, September 14, 2005 10:22 AM  
To: Alstadt, Lynn  
Subject: Use of Haynes Trademarks (Letter Dated 09-13-05)  
  
Attachments: Haynes Trademark Corrections.pdf; Haynes Trademark Approval.pdf



Haynes Trademark Haynes Trademark  
Corrections.p... Approval.pdf ...

Good morning Lynn;

Thank you for taking the time yesterday to discuss the above referenced letter. As I mentioned during our telephone conversation, I would make the necessary changes to our website immediately. The changes are now complete. Please see the attachment and verify it meets with your approval. I have also attached an e-mail from Paul Manning authorizing National Speciality Alloys to use Haynes trademarks in our website.

I will follow up with you this afternoon via telephone once you have had a chance to review the changes.

Thank you again for your time and please call with any questions or comments you might have.

--

---

Charles Dawson  
National Speciality Alloys  
281-345-2115  
cdawson@nationalspeciality.com  
www.nationalspeciality.com

HE 00803

Nickel Alloy 200, Nickel Alloy 400, Nickel Alloy 500, Nickel Alloy 625, Nickel Alloy 718, Nickel Alloy 800, Microalloyed Steel, Titanium, Tungsten, Vanadium, A-286, C-22®, C-276, Alloy 20, 904L, 925, 718 HT																																																											
<p>File Edit View Favorites Tools Help</p> <p>3 Page 100% Back Forward Stop Refresh Favorites Print Home</p> <p>Address http://www.nationalspecialty.com/special_alloys.html</p> <p>NATIONAL SPECIALTY COMPANY INC.</p> <p>Specialty Metals &amp; Alloys</p> <p>Alloy 200, Alloy 400, Alloy 500, Alloy 625, Alloy 718, Alloy 800, Microalloyed Steel, Titanium, Tungsten, Vanadium, A-286, C-22®, C-276, Alloy 20, 904L, 925, 718 HT</p> <p><b>Predicts</b></p> <p><b>Servidor</b></p> <p><b>Contact Us</b></p> <p><b>Reference</b></p> <p><b>Alloy 400</b></p> <p><b>Print A Line Sheet</b></p> <p><b>Home</b></p> <p><b>Specialty Metals &amp; Alloys</b></p> <p><b>Nickel &amp; Special Alloys</b></p> <p><b>Bars, Shapes, Forgings, Castings</b></p> <p><b>From Inventory or Mill Orders</b></p> <table border="1"> <thead> <tr> <th>1"</th> <th>1-1/4"</th> <th>1-1/2"</th> <th>1-3/4"</th> </tr> </thead> <tbody> <tr> <td>2"</td> <td>2-1/4"</td> <td>2-1/2"</td> <td>2-3/4"</td> </tr> <tr> <td>3"</td> <td>3-1/4"</td> <td>3-1/2"</td> <td>3-3/4"</td> </tr> <tr> <td>4"</td> <td>4-1/4"</td> <td>4-1/2"</td> <td>4-3/4"</td> </tr> <tr> <td>5"</td> <td>5-1/2"</td> <td></td> <td></td> </tr> <tr> <td>6"</td> <td>6-1/2"</td> <td></td> <td></td> </tr> <tr> <td>7"</td> <td>7-1/2"</td> <td></td> <td></td> </tr> <tr> <td>8"</td> <td>8-1/2"</td> <td></td> <td></td> </tr> <tr> <td>9"</td> <td>9-1/2"</td> <td></td> <td></td> </tr> <tr> <td>10"</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Per AMS - ASTM - QQ-S Specifications</p> <p>* Nickel 405 is also available in hex, 1/2" thru 2"</p> <p>Nickel and other special alloys are used in aerospace, marine, chemical, petrochemical, oil and gas, waste processing, and power generation industries. Please call us on any hard-to-find items.</p> <p>Call NSA on any size, shape and alloy that is not listed.</p> <p><b>Steel Bar Specification</b></p> <table border="1"> <thead> <tr> <th>TYPE</th> <th>AMS</th> <th>ASTM</th> <th>FEDERAL</th> <th>CHARACTERISTICS</th> <th>TYPE</th> <th>AMS</th> <th>ASTM</th> <th>FEDERAL</th> <th>CHARACTERISTICS</th> </tr> </thead> </table> <p>Done</p> <p>Start</p> <p>© 1999 National Specialty Company Inc.</p> <p>Advanced Revision 3.0</p> <p>© Nickel Alloy 200, NICKEL ALLOY 400, NICKEL ALLOY 500, NICKEL ALLOY 625, NICKEL ALLOY 718, NICKEL ALLOY 800, MICROALLOYED STEEL, TITANIUM, TUNGSTEN, VANADIUM, A-286, C-22®, C-276, ALLOY 20, 904L, 925, 718 HT</p>										1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/4"	2-1/2"	2-3/4"	3"	3-1/4"	3-1/2"	3-3/4"	4"	4-1/4"	4-1/2"	4-3/4"	5"	5-1/2"			6"	6-1/2"			7"	7-1/2"			8"	8-1/2"			9"	9-1/2"			10"				TYPE	AMS	ASTM	FEDERAL	CHARACTERISTICS	TYPE	AMS	ASTM	FEDERAL	CHARACTERISTICS
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HE 00804

**Subject:** Fw: National Speciality in Houston, TX  
**From:** "Jeff" <jeff@topspotims.com>  
**Date:** Tue, 12 Jul 2005 14:48:52 -0500  
**To:** "Charles Dawson" <CDAWSON@nationalspeciality.com>

----- Original Message -----

**From:** Paul Manning  
**To:** Jeff Montgomery  
**Sent:** Wednesday, February 23, 2005 2:12 PM  
**Subject:** Re: National Speciality in Houston, TX

We checked sales records and verified that they are a good customer and can use the HASTELLOY® trademark and of course should reference that it is a registered trademark of Haynes International Inc. C-276 is not a trademark but C-22® and C-2000® are. Thanks for the front end check in the issue.

Regards  
Paul Manning

Jeff Montgomery wrote:

Paul, Thanks so much for time today in regards to Trademark issues and internet marketing. I have a client, National Speciality in Houston, TX ([www.nationalspeciality.com](http://www.nationalspeciality.com)) that would like to advertise under Hastelloy, C-276, etc. on the search engines. They are a client of yours and sell your product. Please let me know if this is acceptable.Jeff Montgomery

Top Spot IMS  
4545 Post Oak Place, Suite 120  
Houston, TX 77027  
713-552-0888  
713-552-0883 - Fax  
713-397-4499 - Cellular

HE 00805

**Buchanan Ingersoll PC**

ATTORNEYS

Lynn J. Alstadt  
 412 562 1632  
 alstadtlj@bipc.com

One Oxford Centre  
 301 Grant Street, 20th Floor  
 Pittsburgh, PA 15219-1410  
 T 412 562 8800  
 F 412 562 1041  
 www.buchananingersoll.com

September 12, 2005

**VIA FACSIMILE AND FIRST CLASS MAIL**

Steve Bisset, President  
 Newman Flange & Fitting Co.  
 1649 L. Street  
 Newman, CA 95360-1048

**Re: Use of Haynes Trademarks**

Dear Mr. Bisset:

We represent Haynes International, Inc. As you know, Haynes has several registered trademarks for the metal alloys that you purchase from Haynes and re-sell to your customers. The marks are listed on the enclosed report from the United States Patent and Trademark Office. While you may use Haynes' trademarks in conjunction with the sale of products that you purchase from Haynes, any use of Haynes' trademarks should indicate that the trademarks you use are trademarks of Haynes International. In addition, you may not offer to sell a product under a Haynes trademark and then substitute an alloy from another manufacturer when an order is received.

Enclosed is a copy of a web page of your company in which Haynes' registered C-22 trademark is used incorrectly. We, therefore, ask that you immediately make the corrections described below and noted in red on the enclosed copy of your web page.

The mark has a dash between the letter and number. The ® designation should appear as a superscript adjacent to the end of the trademark. This designation should be used everywhere the registered mark appears. There should also be a line added that says: "C-22 is a registered trademark of Haynes International, Inc."

Continued use of the enclosed web page or any brochures in which the Haynes trademarks appear without being identified as such constitutes misuse of Haynes trademarks. If such misuse continues Haynes will be required to take legal action against your company to stop the misuse or lose valuable trademark rights. It is our hope that you will promptly correct the web page. Otherwise, Haynes will be forced to choose between suing an important customer or losing its trademark rights.

Please tell me by September 30, 2005, whether you will change your web page and if so, when the change will be made.

**HE 00806**

September 12, 2005

Page - 2 -

Should you decide to use any Haynes trademarks in any future web pages, brochures or advertisements, I suggest that you send a draft to me or Paul Manning at Haynes International for review before the web page, brochure or advertisement is published. We will promptly review your publication and correct any incorrect use of a Haynes trademark.

If you have any questions or concerns, please call me.

Very truly yours,



Lynn J. Alstadt

LJA/bem

Enclosures

cc: Paul Manning (w/encl.)

HE 00807



United States Patent and Trademark Office

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OR  to record:

23 Records(s) found (This page: 1 ~ 23)

[Refine Search](#) (Haynes)[ON] and (International)[ON] not (Seasol)[ON] and (live)[LD]

Current Search: S4: (Haynes)[ON] and (International)[ON] not (Seasol)[ON] and (live)[LD] docs: 23 occ: 71

	Serial Number	Reg. Number	Word Mark	Check Status	Live/Dead
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22	71586534	0566221	HAYNES	TARR	LIVE
23	71292933	0269898	HASTELLOY	TARR	LIVE

HE 00808



## Materials Used

### Materials Available for Quoting:

90/10 CUNI

ALLOY B2

ALLOY 800

70/30 CUNI

ALLOY C22

ALLOY 800HT

ALLOY 20 CB3

ALLOY C276

ALLOY 825

254 SMO

TITANIUM GR 2

ALLOY 600

AL6XN

FERRILIUM 255

ALLOY 601

ALLOY 400

25-6 MO

ALLOY 625

ALLOY 200

904L

ALLOY 201

C-22 is a registered trademark of Haynes International, Inc.

[\[Home\]](#) [\[Mission Statement\]](#) [\[Nickel & Alloy Flanges\]](#) [\[Military Flanges\]](#) [\[Contact\]](#)

HE 00809

EC 0259

 Materials Used 

Materials Available for Quoting:

90/10 CUNI	ALLOY B2 & B3	ALLOY 800
70/30 CUNI	ALLOY C-22 ®	ALLOY 800HT
ALLOY 20	ALLOY C276	ALLOY 825
F44	TITANIUM GR 2	ALLOY 600
UNS80367	FERRILIUM 255	ALLOY 601
ALLOY 400	25-6 MO	ALLOY 625
ALLOY 200	904L	ALLOY 201

C-22 is a registered trademark of Haynes International, Inc.

[\[Home\]](#) [\[Mission Statement\]](#) [\[Nickel & Alloy Flanges\]](#) [\[Military Flanges\]](#) [\[Contact\]](#)

HE 00810

**Buchanan Ingwersoll PC**

ATTORNEYS

Lynn J. Alstadt  
 412 562 1632  
 alstadtlj@bipc.com

One Oxford Centre  
 301 Grant Street, 20th Floor  
 Pittsburgh, PA 15219-1410  
 T 412 562 8800  
 F 412 562 1041  
 www.buchananingersoll.com

September 12, 2005

**VIA FACSIMILE AND FIRST CLASS MAIL**

Mark Ashworth, CEO  
 Oxford Alloys, Inc.  
 2632 TEE Drive  
 Baton Rouge, LA 70814

**Re: Use of Haynes Trademarks**

Dear Mr. Ashworth:

We represent Haynes International, Inc. As you know, Haynes has several registered trademarks for the metal alloys that you purchase from Haynes and re-sell to your customers. The marks are listed on the enclosed report from the United States Patent and Trademark Office. While you may use Haynes' trademarks in conjunction with the sale of products that you purchase from Haynes, any use of Haynes' trademarks should indicate that the trademarks you use are trademarks of Haynes International. In addition, you may not offer to sell a product under a Haynes trademark and then substitute an alloy from another manufacturer when an order is received.

Enclosed is a copy of your web pages in which several Haynes' registered trademarks are used incorrectly. We, therefore, ask that you immediately make the corrections described below and noted in red on the enclosed copies.

The ® designation should appear as a superscript adjacent to the end of each trademark. This designation should be used everywhere the registered mark appears. There should also be a line added that says: "B-3, C-22, C-2000 and G-30 are registered trademarks of Haynes International, Inc."

Continued use of the enclosed web pages or any brochures in which the Haynes trademarks appear without being identified as such constitutes misuse of Haynes trademarks. If such misuse continues Haynes will be required to take legal action against your company to stop the misuse or lose valuable trademark rights. It is our hope that you will promptly correct the enclosed web pages so that Haynes is not forced to choose between suing an important customer or losing its trademark rights.

Please tell me by September 30, 2005, whether you will change your web pages and, if so, when the change will be made.

**HE 00811**

September 12, 2005

Page - 2 -

Should you decide to use any Haynes trademarks in any future web pages, brochures or advertisements, I suggest that you send a draft to me or Paul Manning at Haynes International for review before the web page, brochure or advertisement is published. We will promptly review your publication and correct any incorrect use of a Haynes trademark.

If you have any questions or concerns, please call me.

Very truly yours,



Lynn J. Alstadt

LJA/bem

Enclosures

cc: Paul Manning (w/encl.)

HE 00812



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OR  to record:
**23 Records(s) found (This page: 1 ~ 23)**
 (Haynes)[ON] and (International)[ON] not ( 

Current Search: S4: (Haynes)[ON] and (International)[ON] not (Seasol)[ON] and (live)[LD] docs: 23 occ: 71

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1	76442604	2816268	556	TARR	LIVE
2	76434700		282	TARR	LIVE
3	76423154	2785667	D-205	TARR	LIVE
4	76423153	2755568	230-W	TARR	LIVE
5	76423152	2752325	214	TARR	LIVE
6	76423151	2752324	242	TARR	LIVE
7	76400933	2832716	G-35	TARR	LIVE
8	76400932		C-22HS	TARR	LIVE
9	75646170	2532561	625SQ	TARR	LIVE
10	75047108	2023945	HR-120	TARR	LIVE
11	74697077	1982521	230	TARR	LIVE
12	74697076	2002631	C-2000	TARR	LIVE
13	74673214	2063855	B-3	TARR	LIVE
14	74174760	1717465	HR-160	TARR	LIVE
15	74168140	1711142	G-50	TARR	LIVE
16	74023771	1742719	ULTIMET	TARR	LIVE
17	73701791	1600332	G-30	TARR	LIVE
18	73701790	1953864	C-22	TARR	LIVE
19	72159440	0759676	MULTIMET	TARR	LIVE
20	72157340	0756690	MULTIMET	TARR	LIVE
21	71667590	0605011	HASTELLOY	TARR	LIVE
22	71586534	0566221	HAYNES	TARR	LIVE
23	71292933	0269898	HASTELLOY	TARR	LIVE

HE 00813



**Supplier and Processor of Welding Alloys**

## NICKEL ALLOYS

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### FLUX COATED ELECTRODES

### TIG, MIG AND COIL WIRE - SOLID

### FLUX CORED WIRE

### STRIP

#### FLUX COATED ELECTRODES

Type	Class	Type	Class
Alloy 141	(ENi-1)	Alloy C-276	(ENiCrMo-4)
Alloy 190	(ENiCu-7)	Alloy C	(ENiCrMo-5)
Alloy 132	(ENiCrFe-1)	Alloy Ni-9	(ENiCrMo-6)
Alloy 135		Alloy C-4	(ENiCrMo-7)
Alloy A	(ENiCrFe-2)	Alloy G-3	(ENiCrMo-9)
Alloy 182	(ENiCrFe-3)	Alloy C-22	(ENiCrMo-10)
Alloy B	(ENiMo-1)	Alloy G-30	(ENiCrMo-11)
Alloy W	(ENiMo-3)	Alloy P-12	(ENiCrMo-12)
Alloy B-2	(ENiMo-7)	Alloy 187	(ECuNi)
Alloy B-3	(ENiMo-10)	Alloy 55	(ENiFe-CI)
Alloy 117	(ENiCrCoMo-1)	Alloy 99	(ENi-CI)
Alloy G	(ENiCrMo-1)	Alloy 112	(ENiCrMo-3)
Alloy X	(ENiCrMo-2)		

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#### TIG, MIG AND COIL WIRE - SOLID

Type	Class	Type	Class
Alloy 55	(ERNiFe-CI)	Alloy 625	(ERNiCrMo-3)
Alloy 61	(ERNi-1)	Alloy C-276	(ERNiCrMo-4)
Alloy 60	(ERNiCu-7)	Alloy C-4	(ERNiCrMo-7)
Alloy 65	(ERNiFeCr-1)	Alloy C-2000	(ERNiCrMo-17)

HE 00814

EC 0317

3/10/2005

Alloy 82	(ERNiCr-3)	Alloy G-2	(ERNiCrMo-8)
Alloy 62	(ERNiCrFe-5)	Alloy G-3	(ERNiCrMo-9)
Alloy 92	(ERNiCrFe-6)	Alloy C-22	(ERNiCrMo-10)
Alloy 99	(ERNi-CI)	Alloy G-30	(ERNiCrMo-11)
Alloy 718	(ERNiFeCr-2)	Alloy 617	(ERNiCrCoMo-1)
Alloy B	(ERNiMo-1)	Alloy 686	(ERNiCrMo-14)
Alloy N	(ERNiMo-2)	Alloy 601	(ERNiCrFe-11)
Alloy W	(ERNiMo-3)	Alloy 52	(ERNiCrFe-7)
Alloy B-2	(ERNiMo-7)	Alloy 72	(ERNiCr-4)
Alloy B-3	(ERNiMo-10)	Alloy 59	(ERNiCrMo-13)
Alloy G	(ERNiCrMo-1)	Alloy 67	(ERCuNi)
Alloy X	(ERNiCrMo-2)		

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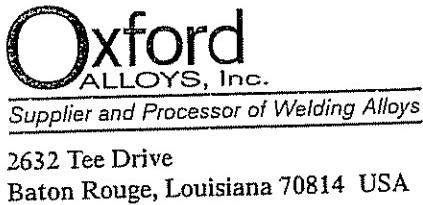
FLUX CORED WIRE	
61T-1	
82T-1	
625T-1	
55T-1	
99T-1	
C-22T-1	
C-276T-1	

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STRIP			
Type	Class	Type	Class
Alloy 60	(EQNiCu-7)	Alloy C-4	(EQNiCrMo-7)
Alloy 82	(EQNiCr-3)	Alloy C-22	(EQNiCrMo-10)
Alloy 65	(EQNiFeCr-1)	Alloy 61	(EQNi-1)
Alloy 625	(EQNiCrMo-3)	Alloy 67	(ERCuNi)
Alloy C-276	(EQNiCrMo-4)	Alloy 59	(EQNiCrMo-13)

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B-3, C-22, C-2000 and 6-30 are registered trademarks of Haynes International, Inc.  
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BUCHANAN PC	800-562-3355
	<a href="http://www.oxfordalloys.com">www.oxfordalloys.com</a>
	<a href="mailto:sales@oxfordalloys.com">sales@oxfordalloys.com</a>

September 29, 2005

Lynn J. Alstadt  
 Buchanan Ingersoll PC  
 One Oxford Centre  
 301 Grant Street, 20<sup>th</sup> Floor  
 Pittsburgh, PA 15219-1410

**Re: Use of Haynes Trademarks**

Dear Ms. Alstadt:

We received your letter dated September 12, 2005 regarding the use of Haynes trademarks. We have contacted our website designer and they will promptly begin making the changes. We expect the changes to be live in the next 2-3 weeks but we do not have a specific date yet. I will contact you again when the changes are complete.

We apologize for the misunderstanding related to the trademark use. We have noted your requirements in our internal records and will be diligent in our future use of the Haynes trademark. Should you have any further questions or concerns, please contact me.

Sincerely,

Mark Ashworth  
 CEO

HE 00816

**Buchanan Ingersoll PC**

ATTORNEYS

Lynn J. Alstadt  
 412 562 1632  
 alstadtlj@bipc.com

One Oxford Centre  
 301 Grant Street, 20th Floor  
 Pittsburgh, PA 15219-1410  
 T 412 562 8800  
 F 412 562 1041  
[www.buchananingersoll.com](http://www.buchananingersoll.com)

September 12, 2005

**VIA FACSIMILE AND FIRST CLASS MAIL**

Ronald Lafferty, President  
 Penn Machine Works, Inc.  
 201 Bethel Avenue  
 Aston, PA 19014

**Re: Use of Haynes Trademarks**

Dear Mr. Lafferty:

We represent Haynes International, Inc. As you know, Haynes has several registered trademarks for the metal alloys that you purchase from Haynes and re-sell to your customers. The marks are listed on the enclosed report from the United States Patent and Trademark Office. While you may use Haynes' trademarks in conjunction with the sale of products that you purchase from Haynes, any use of Haynes' trademarks should indicate that the trademarks you use are trademarks of Haynes International. In addition, you may not offer to sell a product under a Haynes trademark and then substitute an alloy from another manufacturer when an order is received.

Enclosed is a copy of your web pages in which Haynes' C-22 registered trademark is used incorrectly. We, therefore, ask that you immediately make the corrections described below and noted in red on the enclosed copies.

There should be a dash between the letter and the number. The ® designation should appear as a superscript adjacent to the end of the trademark. This designation should be used everywhere the registered mark appears. There should also be a line added that says: "C-22 is a registered trademark of Haynes International, Inc."

Continued use of the enclosed web pages or any brochures in which the Haynes trademarks appear without being identified as such constitutes misuse of Haynes trademarks. If such misuse continues Haynes will be required to take legal action against your company to stop the misuse or lose valuable trademark rights. It is our hope that you will promptly correct the enclosed web pages so that Haynes is not forced to choose between suing an important customer or losing its trademark rights.

Please tell me by September 30, 2005, whether you will change your web pages and if so, when the change will be made.

HE 00817

September 12, 2005

Page - 2 -

Should you decide to use any Haynes trademarks in any future web pages, brochures or advertisements, I suggest that you send a draft to me or Paul Manning at Haynes International for review before the web page, brochure or advertisement is published. We will promptly review your publication and correct any incorrect use of a Haynes trademark.

If you have any questions or concerns, please call me.

Very truly yours,



A handwritten signature in black ink, appearing to read "Lynn J. Alstadt".

Lynn J. Alstadt

LJA/bem

Enclosures

cc: Paul Manning (w/encl.)

HE 00818



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Current Search: S4: (Haynes)[ON] and (International)[ON] not (Seasol)[ON] and (live)[LD] docs: 23 occ: 71

	Serial Number	Reg. Number	Word Mark	Check Status	Live/Dead
1	76442604	2816268	556	TARR	LIVE
2	76434700		282	TARR	LIVE
3	76423154	2785667	D-205	TARR	LIVE
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5	76423152	2752325	214	TARR	LIVE
6	76423151	2752324	242	TARR	LIVE
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20	72157340	0756690	MULTIMET	TARR	LIVE
21	71667590	0605011	HASTELLOY	TARR	LIVE
22	71586534	0566221	HAYNES	TARR	LIVE
23	71292933	0269898	HASTELLOY	TARR	LIVE

HE 00819

9/12/2005

# Penn Machine

## Nickel Alloy Material Grade Composition Chart

NAME	ASTM#	GRADE	UNS #	NOMINAL COMPOSITION
ALLOY 200	FORGING B564	A200	N02200	C-.15max Cr-.01max Ni-99min Cu-.25max Fe-.4max
ALLOY 200	BAR B160	A200	N02200	C-.15max Cr-.01max Ni-99min Cu-.25max Fe-.4max
ALLOY 400*	FORGING B564	A400	N04400	Ni-63min Cu-28-34 Fe-2.5max
ALLOY 400*	BAR B164	A400	N04400	Ni-63min Cu-28-34 Fe-2.5max
* ALLOY 400 can also be furnished to Federal Specifications QQN-281 *				
ALLOY 600	FORGING B564	A600	N06600	Ni-72min Cr-14-17 Fe-6-10 Cu-.5max
ALLOY 600	BAR B166	A600	N06600	Ni-72min Cr-14-17 Fe-6-10 Cu-.5max
ALLOY 625	FORGING B564	A625	N06625	Ni-58min Cr-20-23 Fe-5max Cb+-3.75-4.15 Al-.4max Ti-.4max
ALLOY 625	BAR B564	B446	N06625	Ni-58min Cr-20-23 Fe-5max Cb+-3.75-4.15 Al-.4max Ti-.4max
ALLOY 800	FORGING B564	A800	N08800	Ni-30-35 Cr-19-23 Fe-39.5min Al-.15-.60 Ti-.15-.60 C-.10max
ALLOY 800	BAR B408	B408	N08800	Ni-30-35 Cr-19-23 Fe-39.5min Al-.15-.60 Ti-.15-.60 C-.10max
ALLOY 800H	FORGING B564	A800H	N08810	Ni-30-35 Cr-19-23 Fe-39.5min Al-.15-.60 Ti-.15-.60 C-.05-.10
ALLOY 800H	BAR B408	A800H	N08810	Ni-30-35 Cr-19-23 Fe-39.5min Al-.15-.60 Ti-.15-.60 C-.05-.10
ALLOY 800HT	FORGING B564	A800HT	N08811	Ni-30-35 Cr-19-23 Fe-39.5min Al-.15-.60 Ti-.15-.60 Al+Ti-.85-1.2 C-.06-.10
ALLOY 800HT	BAR B408	A800HT	N08811	Ni-30-35 Cr-19-23 Fe-39.5min Al-.15-.60 Ti-.15-.60 Al+Ti-.85-1.2 C-.06-.10
ALLOY 825	FORGING B564	A825	N08825	Ni-38-46 Cr-19.5-23.5 Mo-2.5-3.5 Fe-22min Cu-1.5-3 Al-.2max Ti-.6-1.2 C-.05
ALLOY 825	BAR B425	A825	N08825	Ni-38-46 Cr-19.5-23.5 Mo-2.5-3.5 Fe-22min Cu-1.5-3 Al-.2max Ti-.6-1.2 C-.05
C276	FORGING B564	A276	N10276	Cr-14.5-16.5 Mo-15-17 Fe-4-7 W-3-4.5 Co-2.5max V-.35max ( Nickel remnant )

HE 00820

EC 0333

C276	BAR B574	A276	N10276	Cr-14.5-16.5 Mo-15-17 Fe-4-7 W-3-4.5 Co-2.5max V-.35max ( Nickel remnant )
B-2	FORGING B335	ALLOY B- 2	N10665	Cr-1max Mo-26-30 Fe-2max Co-1max
B-2	BAR B335	ALLOY B- 2	N10665	Cr-1max Mo-26-30 Fe-2max Co-1max
C-22 <sup>(R)</sup> C22	FORGING B564	AC22	N06022	Cr-20-22.5 Mo-12.5-14.5 Fe-2-6 W-2.5-3.5 Co-2.5max V-. .35max ( Nickel remnant )
C-22 <sup>(R)</sup> C22	BAR B574	AC22	N06022	Cr-20-22.5 Mo-12.5-14.5 Fe-2-6 W-2.5-3.5 Co-2.5max V-. .35max ( nickel remnant )

[Carbon steel](#) | [Stainless steel](#) | [Chrome moly](#) | [Titanium](#) | [Aluminum](#) | [Copper nickel](#)  
[Materials](#) | [Request quote/information](#) | [Home](#)

C-22 is a registered trademark of Hayes International, LLC.  
 Web site created by Penn Machine. Send questions or comments to [John Lafferty](#).

HE 00821

EC 0334



## Materials

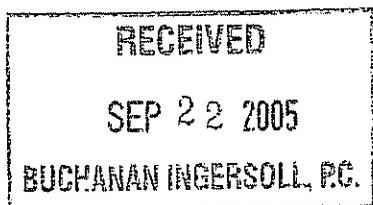
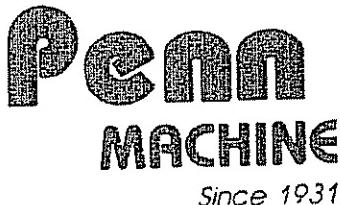
Carbon steels	A105: Galvanized, Normalized, Plus A694- Y42; Y52; Y60; Y65 A106B, WPB
Low Temp Carbon	LF2, LF3, WPL6, WPL3
Stainless steels	304/304L, 316/316L, 310, 317L, 321/H, 347/H, AL6XN (N08367), F44 (254SMO), F51 (2205), F53 (2207) 405, 410, F6A, A904L (N08904), Alloy 20 (N08020)
Nickel alloys	A400 (N04400), A200 (N02200), A201 (N02201), A800 (N08800), A800H (N08810), A800HT (N08811), A825 (N08825), A600 (N06600), A625 (N06625), C276 (N10276), C22 (N06022), B2 (N10665)
Chrome moly alloys	F11, F12, F22, F5, F9, F91, F92
Titanium	Grade 1, Grade 2, Grade 3, Grade 4
Aluminum alloys	6061, 5083, 5086
Copper nickel	70/30, 90/10

[Penn Machine home page](#)

*Web site created by Penn Machine. Send questions or comments to John Lafferty.*

HE 00822

EC 0335



PENNSYLVANIA MACHINE WORKS, INC.  
201 BETHEL AVENUE  
ASTON, PENNSYLVANIA 19014  
(610) 497-3300 – FAX (610) 497-3325  
[www.pennusa.com](http://www.pennusa.com)

September 21, 2005

Mr. Lynn J. Alstadt  
Buchanan Ingersoll PC  
One Oxford Centre  
301 Grant Street, 20th Floor  
Pittsburgh, PA. 15219

Reference : Use of Haynes Trademarks (letter dated : September 12, 2005)

Dear Mr. Alstadt,

I would like to apologize on behalf of Pennsylvania Machine Works, we were not aware that "C-22" was a registered trademark of Haynes International, Inc. We have been a user of Haynes material for many years and have been a loyal customer via purchasing much of their material through bar distribution.

I have made the necessary changes to our website at WWW.PENNUSA.COM as of September 21, 2005 and assure you that this was not intentional not to have them listed. Any questions, please do not hesitate to contact myself at 610-497-3300 (ext. 536).

Sincerely,



John P. Lafferty  
Quality Manager

enclosure : 1) letter to Ronald Lafferty  
2) revised web pages

HE 00823

**Buchanan Ingwersoll PC**

ATTORNEYS

Lynn J. Alstadt  
412 562 1632  
alstadtlj@bipc.com

One Oxford Centre  
301 Grant Street, 20th Floor  
Pittsburgh, PA 15219-1410

T 412 562 8800  
F 412 562 1041  
[www.buchananingersoll.com](http://www.buchananingersoll.com)

September 12, 2005

**VIA FACSIMILE AND FIRST CLASS MAIL**

Ronald Lafferty, President  
Penn Machine Works, Inc.  
201 Bethel Avenue  
Aston, PA 19014

Re: Use of Haynes Trademarks

Dear Mr. Lafferty:

We represent Haynes International, Inc. As you know, Haynes has several registered trademarks for the metal alloys that you purchase from Haynes and re-sell to your customers. The marks are listed on the enclosed report from the United States Patent and Trademark Office. While you may use Haynes' trademarks in conjunction with the sale of products that you purchase from Haynes, any use of Haynes' trademarks should indicate that the trademarks you use are trademarks of Haynes International. In addition, you may not offer to sell a product under a Haynes trademark and then substitute an alloy from another manufacturer when an order is received.

Enclosed is a copy of your web pages in which Haynes' C-22 registered trademark is used incorrectly. We, therefore, ask that you immediately make the corrections described below and noted in red on the enclosed copies.

There should be a dash between the letter and the number. The ® designation should appear as a superscript adjacent to the end of the trademark. This designation should be used everywhere the registered mark appears. There should also be a line added that says: "C-22 is a registered trademark of Haynes International, Inc."

Continued use of the enclosed web pages or any brochures in which the Haynes trademarks appear without being identified as such constitutes misuse of Haynes trademarks. If such misuse continues Haynes will be required to take legal action against your company to stop the misuse or lose valuable trademark rights. It is our hope that you will promptly correct the enclosed web pages so that Haynes is not forced to choose between suing an important customer or losing its trademark rights.

Please tell me by September 30, 2005, whether you will change your web pages and if so, when the change will be made.

HE 00824

September 12, 2005

Page - 2 -

Should you decide to use any Haynes trademarks in any future web pages, brochures or advertisements, I suggest that you send a draft to me or Paul Manning at Haynes International for review before the web page, brochure or advertisement is published. We will promptly review your publication and correct any incorrect use of a Haynes trademark.

If you have any questions or concerns, please call me.

Very truly yours,



Lynn J. Alstadt

LJA/bem

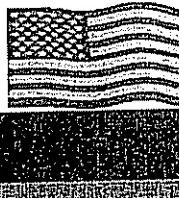
Enclosures

cc: Paul Manning (w/encl.)

HE 00825



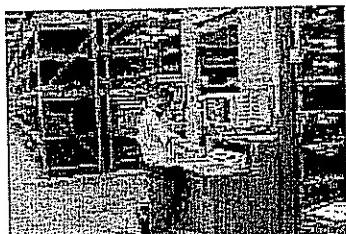
# Manufacturer of high-pressure forged pipe fittings



PA Sales Staff

TECH Sales Staff

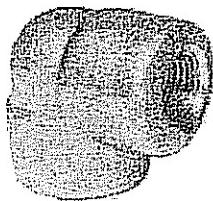
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Any comments? Please send e-mail to [John Lafferty](#).

HE 00826



## Materials

Carbon steels	A105: Galvanized, Normalized, Plus A694- Y42; Y52; Y60; Y65 A106B, WPB
Low Temp Carbon	LF2, LF3, WPL6, WPL3
Stainless steels	304/304L, 316/316L, 310, 317L, 321/H, 347/H, AL6XN (N08367), F44 (254SMO), F51 (2205), F53 (2207) 405, 410, F6A, A904L (N08904), Alloy 20 (N08020)
Nickel alloys	A400 (N04400), A200 (N02200), A201 (N02201), A800 (N08800), A800H (N08810), A800HT (N08811), A825 (N08825), A600 (N06600), A625 (N06625), C276 (N10276), C-22 * (N06022), B2 (N10665)
Chrome moly alloys	F11, F12, F22, F5, F9, F91, F92
Titanium	Grade 1, Grade 2, Grade 3, Grade 4
Aluminum alloys	6061, 5083, 5086
Copper nickel	70/30, 90/10

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HE 00827

# Penn Machine

## Nickel Alloy Material Grade Composition Chart

NAME	ASTM#	GRADE	UNS #	NOMINAL COMPOSITION
ALLOY 200	FORGING B564	A200	N02200	C-.15max Cr-.01max Ni-99min Cu-.25max Fe-.4max
ALLOY 200	BAR B160	A200	N02200	C-.15max Cr-.01max Ni-99min Cu-.25max Fe-.4max
ALLOY 400*	FORGING B564	A400	N04400	Ni-63min Cu-28-34 Fe-2.5max
ALLOY 400*	BAR B164	A400	N04400	Ni-63min Cu-28-34 Fe-2.5max

\* ALLOY 400 can also be furnished to Federal Specifications QQ-N-281 \*

ALLOY 600	FORGING B564	A600	N06600	Ni-72min Cr-14-17 Fe-6-10 Cu-.5max
ALLOY 600	BAR B166	A600	N06600	Ni-72min Cr-14-17 Fe-6-10 Cu-.5max
ALLOY 625	FORGING B564	A625	N06625	Ni-58min Cr-20-23 Fe-5max Cb+-3.75-4.15 Al-.4max Ti-.4max
ALLOY 625	BAR B564	B446	N06625	Ni-58min Cr-20-23 Fe-5max Cb+-3.75-4.15 Al-.4max Ti-.4max
ALLOY 800	FORGING B564	A800	N08800	Ni-30-35 Cr-19-23 Fe-39.5min Al-.15-.60 Ti-.15-.60 C-.10max
ALLOY 800	BAR B408	B408	N08800	Ni-30-35 Cr-19-23 Fe-39.5min Al-.15-.60 Ti-.15-.60 C-.10max
ALLOY 800H	FORGING B564	A800H	N08810	Ni-30-35 Cr-19-23 Fe-39.5min Al-.15-.60 Ti-.15-.60 C-.05-.10
ALLOY 800H	BAR B408	A800H	N08810	Ni-30-35 Cr-19-23 Fe-39.5min Al-.15-.60 Ti-.15-.60 C-.05-.10
ALLOY 800HT	FORGING B564	A800HT	N08811	Ni-30-35 Cr-19-23 Fe-39.5min Al-.15-.60 Ti-.15-.60 Al+Ti-.85-1.2 C-.06-.10
ALLOY 800HT	BAR B408	A800HT	N08811	Ni-30-35 Cr-19-23 Fe-39.5min Al-.15-.60 Ti-.15-.60 Al+Ti-.85-1.2 C-.06-.10
ALLOY 825	FORGING B564	A825	N08825	Ni-38-46 Cr-19.5-23.5 Mo-2.5-3.5 Fe-22min Cu-1.5-3 Al-2max Ti-.6-1.2 C-.05
ALLOY 825	BAR B425	A825	N08825	Ni-38-46 Cr-19.5-23.5 Mo-2.5-3.5 Fe-22min Cu-1.5-3 Al-2max Ti-.6-1.2 C-.05
C276	FORGING B564	A276	N10276	Cr-14.5-16.5 Mo-15-17 Fe-4-7 W-3-4.5 Co-2.5max V-.35max ( Nickel remnant )

C276	BAR B574	A276	N10276	Cr-14.5-16.5 Mo-15-17 Fe-4-7 W-3-4.5 Co-2.5max V-.35max ( Nickel remnant )
B-2	FORGING B335	ALLOY B-2	N10665	Cr-1max Mo-26-30 Fe-2max Co-1max
B-2	BAR B335	ALLOY B-2	N10665	Cr-1max Mo-26-30 Fe-2max Co-1max
C-22 *	FORGING B564	AC22	N06022	Cr-20-22.5 Mo-12.5-14.5 Fe-2-6 W-2.5-3.5 Co-2.5max V-.35max ( Nickel remnant )
C-22 *	BAR B574	AC22	N06022	Cr-20-22.5 Mo-12.5-14.5 Fe-2-6 W-2.5-3.5 Co-2.5max V-.35max ( nickel remnant )

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HE 00829



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Current Search: S4: (Haynes)[ON] and (International)[ON] not (Season)[ON] and (live)[LD] docs: 23 occ: 71

	Serial Number	Reg. Number	Word Mark	Check Status	Live/Dead
1	76442604	2816268	556	TARR	LIVE
2	76434700		262	TARR	LIVE
3	76423154	2785667	D-205	TARR	LIVE
4	76423153	2755568	230-W	TARR	LIVE
5	76423152	2752325	214	TARR	LIVE
6	76423151	2752324	242	TARR	LIVE
7	76400933	2832716	G-35	TARR	LIVE
8	76400932		C-22HS	TARR	LIVE
9	75646170	2532561	625SQ	TARR	LIVE
10	75047108	2023945	HR-120	TARR	LIVE
11	74697077	1982521	230	TARR	LIVE
12	74697076	2002631	C-2000	TARR	LIVE
13	74673214	2063655	B-3	TARR	LIVE
14	74174760	1717465	HR-160	TARR	LIVE
15	7416B140	1711142	G-50	TARR	LIVE
16	74023771	1742719	ULTIMET	TARR	LIVE
17	73701791	1600332	G-30	TARR	LIVE
18	73701790	1953664	C-22	TARR	LIVE
19	72159440	0759676	MULTIMET	TARR	LIVE
20	72157340	0756690	MULTIMET	TARR	LIVE
21	71667590	0605011	HASTELLOY	TARR	LIVE
22	71586534	0566221	HAYNES	TARR	LIVE
23	71292933	0269898	HASTELLOY	TARR	LIVE

HE 00830

nickel alloy, special alloy, hastelloy, monel

# Penn Machine

## Nickel Alloy Material Grade Composition Chart

NAME	ASTM#	GRADE	UNS #	NOMINAL COMPOSITION
ALLOY 200	FORGING B564	A200	N02200	C-.15max Cr-.01max Ni-99min Cu-.25max Fe-.4max
ALLOY 200	BAR B160	A200	N02200	C-.15max Cr-.01max Ni-99min Cu-.25max Fe-.4max
ALLOY 400*	FORGING B564	A400	N04400	Ni-63min Cu-28-34 Fe-2.5max
ALLOY 400*	BAR B164	A400	N04400	Ni-63min Cu-28-34 Fe-2.5max
* ALLOY 400 can also be furnished to Federal Specifications QQ-N-281 *				
ALLOY 600	FORGING B564	A600	N06600	Ni-72min Cr-14-17 Fe-6-10 Cu-.5max
ALLOY 600	BAR B166	A600	N06600	Ni-72min Cr-14-17 Fe-6-10 Cu-.5max
ALLOY 625	FORGING B564	A625	N06625	Ni-58min Cr-20-23 Fe-5max Cb+.3.75-.4.15 Al-.4max Ti-.4max
ALLOY 625	BAR B564	B446	N06625	Ni-58min Cr-20-23 Fe-5max Cb+.3.75-.4.15 Al-.4max Ti-.4max
ALLOY 800	FORGING B564	A800	N08800	Ni-30-35 Cr-19-23 Fe-39.5min Al-15-.60 Ti-15-.60 C-10max
ALLOY 800	BAR B408	B408	N08800	Ni-30-35 Cr-19-23 Fe-39.5min Al-15-.60 Ti-15-.60 C-10max
ALLOY 800H	FORGING B564	A800H	N08810	Ni-30-35 Cr-19-23 Fe-39.5min Al-15-.60 Ti-15-.60 C-05-.10
ALLOY 800H	BAR B408	A800H	N08810	Ni-30-35 Cr-19-23 Fe-39.5min Al-15-.60 Ti-15-.60 C-05-.10
ALLOY 800HT	FORGING B564	A800HT	N08811	Ni-30-35 Cr-19-23 Fe-39.5min Al-15-.60 Ti-15-.60 Al+Ti-.85-1.2 C-.06-.10
ALLOY 800HT	BAR B408	A800HT	N08811	Ni-30-35 Cr-19-23 Fe-39.5min Al-15-.60 Ti-15-.60 Al+Ti-.85-1.2 C-.06-.10
ALLOY 825	FORGING B564	A825	N08825	Ni-38-46 Cr-19.5-23.5 Mo-2.5-3.5 Fe-22min Cu-1.5-3 Al-2max Ti-.6-1.2 C-.05
ALLOY 825	BAR B425	A825	N08825	Ni-38-46 Cr-19.5-23.5 Mo-2.5-3.5 Fe-22min Cu-1.5-3 Al-2max Ti-.6-1.2 C-.05
C276	FORGING B564	A276	N10276	Cr-14.5-16.5 Mo-15-17 Fe-4.7 W-3-4.5 Co-2.5max V-.35max (Nickel remnant)

HE 00831

EC 0333

nickel alloy, special alloy, hastelloy, monel

C276	BAR B574	A276	N10276	Cr-14.5-16.5 Mo-15-17 Fe-4-7 W-3-4.5 Co-2.5max V-.35max (Nickel remnant )
B-2	FORGING B335	ALLOY B- 2	N10665	Cr-1max Mo-26-30 Fe-2max Co-1max
B-2	BAR B335	ALLOY B- 2	N10665	Cr-1max Mo-26-30 Fe-2max Co-1max
C-22 <sup>(1)</sup> C22	FORGING B564	AC22	N06022	Cr-20-22.5 Mo-12.5-14.5 Fe-2-6 W-2.5-3.5 Co-2.5max V-. .35max (Nickel remnant )
C-22 <sup>(2)</sup> C22	BAR B574	AC22	N06022	Cr-20-22.5 Mo-12.5-14.5 Fe-2-6 W-2.5-3.5 Co-2.5max V-. .35max ( nickel remnant )

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HE 00832

EC 0334

09/12/2005 04:32PM

Pennsylvania Machine Works: Materials



## Materials

Carbon steels	A105: Galvanized, Normalized, Plus A694- Y42; Y52; Y60; Y65 A106B, WPB
Low Temp Carbon	LF2, LF3, WPL6, WPL3
Stainless steels	304/304L, 316/316L, 310, 317L, 321/H, 347/H, AL6XN (N08367), F44 (254SMO), F51 (2205), F53 (2207) 405, 410, F6A, A904L (N08904), Alloy 20 (N08020)
Nickel alloys	A400 (N04400), A200 (N02200), A201 (N02201), A800 (N08800), A800H (N08810), A800HT (N08811), A825 (N08825), A600 (N06600), A625 (N06625), C276 (N10276), E <sup>22</sup> <sub>27</sub> (N06022), B2 (N10665)
Chrome moly alloys	F11, F12, F22, F5, F9, F91, F92
Titanium	Grade 1, Grade 2, Grade 3, Grade 4
Aluminum alloys	6061, 5083, 5086
Copper nickel	70/30, 90/10

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HE 00833

EC 0335

**Buchanan Ingersoll PC**

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alstadtlj@bjpc.com

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September 22, 2005

Ronald Lafferty, President  
Penn Machine Works, Inc.  
201 Bethel Avenue  
Aston, PA 19014

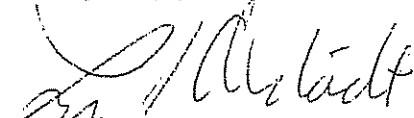
**Re: Use of Haynes Trademarks**

Dear Mr. Lafferty:

Thank you for your prompt response to my letter of September 12. We are pleased to see that you have corrected your web pages to identify C-22 as a registered trademark of Haynes International.

I know that Haynes very much appreciates your business and I thank you for your cooperation in this matter.

Very truly yours,



Lynn J. Alstadt

LJA/bem

cc: Paul Manning

HE 00834

**Buchanan Ingersoll PC**

ATTORNEYS

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alstadtlj@bipc.com

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F 412 562 1041  
www.buchananingersoll.com

September 12, 2005

**VIA FACSIMILE AND FIRST CLASS MAIL**

Jack Elrod, President/CEO  
TW Metals, Inc.  
760 Constitution Drive, Suite 204  
Exton, PA 19341-1149

**Re: Use of Haynes Trademarks**

Dear Mr. Elrod:

We represent Haynes International, Inc. As you know, Haynes has several registered trademarks for the metal alloys that you purchase from Haynes and re-sell to your customers. The marks are listed on the enclosed report from the United States Patent and Trademark Office. While you may use Haynes' trademarks in conjunction with the sale of products that you purchase from Haynes, any use of Haynes' trademarks should indicate that the trademarks you use are trademarks of Haynes International. In addition, you may not offer to sell a product under a Haynes trademark and then substitute an alloy from another manufacturer when an order is received.

Enclosed is a copy of your brochure and web pages in which Haynes' C-22 registered trademark is used incorrectly. We, therefore, ask that you immediately make the corrections described below and noted in red on the enclosed copy of the web pages and brochure.

The ® designation should appear as a superscript adjacent to the end of each trademark. This designation should be used everywhere the registered mark appears. There should also be a line added that says: "C-22 is a trademark of Haynes International, Inc."

Continued use of the enclosed web pages or any brochures in which the Haynes trademarks appear without being identified as such constitutes misuse of Haynes trademarks. If such misuse continues Haynes will be required to take legal action against your company to stop the misuse or lose valuable trademark rights. It is our hope that you will promptly correct your brochure and web pages so that Haynes is not forced to choose between suing an important customer or losing its trademark rights.

Please tell me by September 30, 2005, whether you will change your web pages and brochures and, if so, when the change will be made.

**HE 00835**

September 12, 2005

Page - 2 -

Should you decide to use any Haynes trademarks in any future web pages, brochures or advertisements, I suggest that you send a draft to me or Paul Manning at Haynes International for review before the web page, brochure or advertisement is published. We will promptly review your publication and correct any incorrect use of a Haynes trademark.

If you have any questions or concerns, please call me.

Very truly yours,



A handwritten signature in black ink, appearing to read "Lynn J. Alstadt".

Lynn J. Alstadt

LJA/bem

Enclosures

cc: Paul Manning (w/encl.)

HE 00836



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 (Haynes)[ON] and (International)[ON] not ( Submit)

Current Search: S4: (Haynes)[ON] and (International)[ON] not (Seasol)[ON] and (live)[LD] docs: 23 occ: 71

	Serial Number	Reg. Number	Word Mark	Check Status	Live/Dead
1	76442604	2816268	556	TARR	LIVE
2	76434700		282	TARR	LIVE
3	76423154	2785667	D-205	TARR	LIVE
4	76423153	2755568	230-W	TARR	LIVE
5	76423152	2752325	214	TARR	LIVE
6	76423151	2752324	242	TARR	LIVE
7	76400933	2832716	G-35	TARR	LIVE
8	76400932		C-22HS	TARR	LIVE
9	75646170	2532561	625SQ	TARR	LIVE
10	75047108	2023945	HR-120	TARR	LIVE
11	74697077	1982521	230	TARR	LIVE
12	74697076	2002631	C-2000	TARR	LIVE
13	74673214	2063855	B-3	TARR	LIVE
14	74174760	1717465	HR-160	TARR	LIVE
15	74168140	1711142	G-50	TARR	LIVE
16	74023771	1742719	ULTIMET	TARR	LIVE
17	73701791	1600332	G-30	TARR	LIVE
18	73701790	1953864	C-22	TARR	LIVE
19	72159440	0759676	MULTIMET	TARR	LIVE
20	72157340	0756690	MULTIMET	TARR	LIVE
21	71667590	0605011	HASTELLOY	TARR	LIVE
22	71586534	0566221	HAYNES	TARR	LIVE
23	71292933	0269898	HASTELLOY	TARR	LIVE

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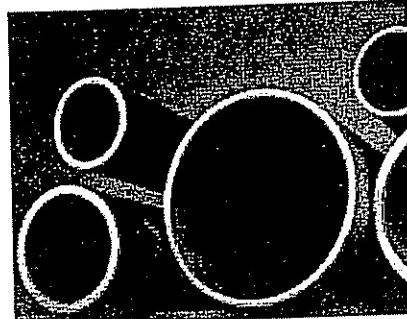
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Spec ASTM A312, ASME SA312

Sizes Special fabricated sizes available


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An extensive size range of drawn and extruded aluminum pipe products that are suitable for a wide range of applications — including marine, cryogenics, and power generation.

Grades 5000 series, especially 5083 and 5086  
6000 series, especially 6061 and 6063

Spec Latest revision of ASTM specs

**Nickel Pipe**

TW Metals is your source for welded and seamless nickel pipe, with decades of experience in serving such industries as corrosion and heat treatment, oil and gas, pulp and paper, and pharmaceuticals.

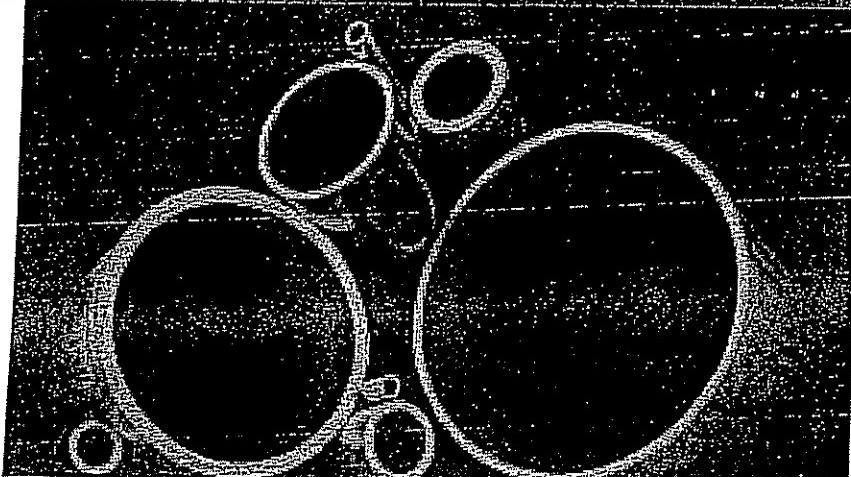
Grades 200, 400, 600, 601, 625, 800, 800H,  
800HT, C276, C-22<sup>®</sup>, Alloy 20

Spec Latest revision of ASTM and ASME specs TW Metals also provides complementary products such as bar, tubing and pipe fittings.

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HE 00838

## PIPE – STAINLESS, ALUMINUM, AND NICKEL



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- Grades: .... 304/L, 316/L, 321
- Specs: .... ASTM A312, ASME SA312
- Sizes: .... Special fabricated sizes available

#### **Aluminum Pipe**

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- Grades: .... 6000 series, especially 6061 and 6063
- Specs: .... Latest revision of ASTM specs

#### **Nickel Pipe**

TW Metals is your source for welded and seamless nickel pipe, with decades of experience in serving such industries as corrosion and heat treatment, oil and gas, pulp and paper, and pharmaceuticals.

- Grades: .... 200, 400, 600, 601, 625, 800, 800H, 800HT, C276, C-22, Alloy 20
- Specs: .... Latest revision of ASTM and ASME specs

*TW Metals also provides complementary products such as bar, tubing and pipe fittings.*

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#### **Full processing capabilities**

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#### **ISO 9001-2000 certified quality**

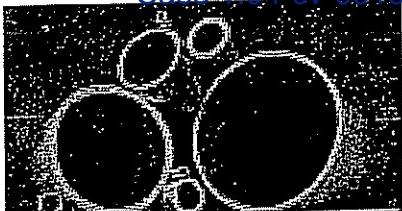
We insist that suppliers meet the highest quality standards in their industries, and conduct regular inspections. And, we maintain test certificates to ensure full material traceability, along with a library of all current international standards and customer specifications.

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PIPE SIZE	O.D. IN INCHES	PIPE SCHEDULES										DBL. E.H.								
		5s	5	10s	10	20	+	30	40s & E.H.	40	⊕	60	80s & E.H.	80	100	120	140	160		
1/8	.405		.035 .1363	.049 .1663	.055 .1663				.058 .2447	.058 .2447			.095 .3145	.095 .3145						
1/4	.540		.049 .2570	.065 .2267	.065 .2267				.088 .4248	.088 .4248			.119 .3531	.119 .3531						
3/8	.675		.049 .3276	.085 .4235	.065 .4235				.091 .5678	.091 .5678			.125 .7388	.125 .7388						
1/2	.840		.065 .5383	.065 .5383	.065 .5710	.065 .5710			.109 .6510	.109 .6510			.147 .1088	.147 .1088						
3/4	1.050		.065 .6838	.065 .6838	.065 .8572	.065 .8572			.113 .9311	.113 .9311			.154 .1474	.154 .1474						
1	1.315		.065 .8678	.065 .8678	.109 .3000	.109 .3000	.109 .4860		.133 .1579	.133 .1579			.179 .2172	.179 .2172						
1 1/4	1.660		.065 .1107	.065 .1107	.109 .1805	.109 .1805	.109 .5200		.140 .2773	.140 .2773			.181 .2937	.181 .2937						
1 1/2	1.900		.065 .4210	.065 .4210	.109 .2085	.109 .2110			.145 .2718	.145 .2718			.200 .3631	.200 .3631						
2	2.375		.065 .1604	.065 .1604	.109 .2638	.109 .2638			.154 .3653	.154 .3653			.218 .5022	.218 .5022						
2 1/2	2.875		.063 .2475	.063 .2475	.120 .3531	.120 .3531			.203 .5763	.203 .5763			.276 .7661	.276 .7661						
3	3.500		.063 .3029	.063 .3029	.120 .4332	.120 .4332			.216 .7576	.216 .7576			.300 .1025	.300 .1025						
3 1/2	4.000		.063 .3472	.063 .3472	.120 .4837	.120 .4837			.226 .9109	.226 .9109			.318 .1251	.318 .1251						
4	4.500		.063 .3915	.063 .3915	.120 .5613	.120 .5613			.237 .1079	.237 .1079			.337 .1498	.337 .1498						
4 1/2	5.000								.247 .1254	.247 .1254			.355 .1761	.355 .1761						
5	5.563		.108 .6349	.108 .6349	.134 .2196	.134 .2196			.258 .1462	.258 .1462			.375 .2078	.375 .2078						
6	6.625		.108 .7505	.108 .7505	.134 .9289	.134 .9289			.280 .1857	.280 .1857			.437 .2857	.437 .2857						
7	7.625								.301 .2354	.301 .2354			.500 .3804	.500 .3804						
8	8.625		.108 .9914	.108 .9914	.148 .1340	.148 .1340	.250 .2238	.177	.277 .5463	.277 .5463	.322 .2855	.322 .2855	.406 .3564	.406 .3564	.500 .4339	.500 .4339	.584 .5099	.584 .5099	.719 .6071	.719 .6071
9	9.625									.342 .3351									.812 .6776	.812 .6776
10	10.75		.134 .1519	.134 .1519	.165 .1865	.165 .1865	.250 .2804	.1079	.278 .1134	.278 .1134	.365 .4048	.365 .4048	.500 .5474	.500 .5474	.594 .6443	.594 .6443	.719 .7703	.719 .7703	.844 .8229	.844 .8229
11	11.75								.375 .4356											
12	12.75		.156 .2157	.185 .2218	.180 .2416	.180 .2416	.250 .3359	.1155	.375 .1714	.375 .1514	.4856 .4856	.4856 .4856	.500 .5352	.500 .5352	.552 .7315	.552 .7315	.688 .6843	.688 .6843	.844 .1073	.844 .1073
14	14.00		.156 .2357		.188 .2773	.188 .3671	.250 .4561		.375 .5457	.375 .5457	.438 .6344	.438 .6344	.500 .5894	.500 .5894	.750 .7209	.750 .7209	.938 .1061	.938 .1061	.1094 .1309	.1094 .1309
16	16.00		.166 .2150		.188 .3175	.188 .4205	.250 .5227		.375 .6258	.375 .6258	.500 .8277	.500 .8277	.552 .1075	.552 .1075	.500 .8277	.500 .8277	.844 .1365	.844 .1365	.1031 .1648	.1031 .1648
18	18.00		.166 .3143		.188 .3575	.188 .4738	.250 .5854		.375 .8215	.375 .7053	.552 .1047		.750 .1382	.750 .1382	.500 .9345	.500 .9345	.938 .1709	.938 .1709	.1375 .2050	.1375 .2050
20	20.00		.166 .3978		.218 .4605	.218 .5273	.250 .7850		.375 .1041	.375 .7850	.594 .1231		.812 .1664	.812 .1664	.500 .1041	.500 .1041	.1031 .2089	.1031 .2089	.1281 .2561	.1281 .2561
24	24.00		.218 .5537		.250 .6341	.250 .6341	.375 .9642		.375 .1407	.375 .9452	.688 .1713		.969 .2384	.969 .2384	.500 .1255	.500 .1255	.1219 .2956	.1219 .2956	.1531 .3674	.1531 .3674
26	26.00								.375 .10263											
28	28.00								.375 .15273	.375 .11054										
30	30.00								.375 .19508	.375 .11865										
32	32.00								.375 .20343	.375 .12656										
34	34.00								.375 .11225	.375 .17889										
36	36.00								.375 .11852											

For nickel and alloy produced to these pipe sizes apply these factors to the red numbers:

Nickel 200 1.1343 Incoloy® 800 1.0247 Inconel® 600 1.0742 Nickel 201 1.1378 Monel® 400 1.1272 Incoloy® 1.0389

For aluminum TUBING alloys produced to the blue numbers listed pipe sizes — apply these factors:

1100 Wt. as shown 2014 Wt. times 1.03 5086 Wt. times .98  
6061 Wt. as shown 2024 Wt. times 1.02 7075 Wt. times 1.03  
6063 Wt. as shown 3003 Wt. times 1.01

\*Registered Trade Mark of INCO C-22 is a registered trademark of Acme International, Inc.

HE 00840

EC 0375

## An Inventory of Superior Products

### Tubing

Materials	Grades/ Alloys	Size Ranges
Aluminum Alloys	2024, 3003, 5052, 6061, 6063, 7075, Seamless, Extruded, Squares, Rectangles, Structural, Ornamentals	Outside Diameters .018" to 12" Wall thickness' from .020 to 1.000"
Stainless Steel	303, 304, 304L, 316, 316L, 321, 347, PH grades, Seamless, Welded and Drawn, As welded, Instrumentation, Squares, Rectangles, Polished, Sanitary, Hypodermic	Outside Diameters .009" to 10" Wall thickness' from .0025 to 2.000"
Nickel Alloys	200, 400, 600, 601, 625, 800H, 825, C-22, Alloy 20	Outside Diameters .009" to 10" Wall thickness' from .0025 to 2.000"
Titanium	CP, 3AL - 2.5V. Ducting	Outside Diameters from 1/4" Wall thickness' from .020"
Alloy	4130, 4340, 8620, 52100, Squares, Rectangles, Streamline	Outside Diameters 3/16" to 10" Wall thickness' from .028" to 1.000"
Carbon	Low Carbon 1020, 1026, DOM, Seamless, As Welded, Hydraulic, Mechanical, Aircraft, Structural Shapes	Outside Diameters .125" to 16" Wall thickness' from .020" to 3"

Standard lengths Aluminum 12'.

Standard lengths other than Aluminum 17/24' lls.

Purchased to Applicable industry specifications.

Custom dimensional requirements available upon request.

C-22 is a registered trademark of Haynes International, Inc.

Coil/Sheet | Rod, Bar, Wire | Tubing | Pipe | Plate | Specialty

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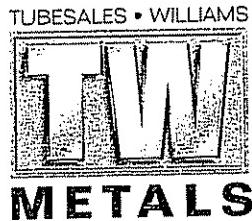


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September 26, 2005

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 Pittsburgh, PA 15219-1410

## RE: Use of Haynes Trademarks

To Whom It May Concern:

We recognize your concern in regards to Haynes Trademarks and to that point we have taken steps to remedy the situation.

All electronic copies of our brochures that are currently posted on our website, as well as our websites themselves, have had the C-22® product removed from reference as of September 22, 2005.

The print copies of our current brochures will be corrected no later than January 1, 2006. We will be removing the alloy listing from both our General Brochure and our Pipe brochure. All existing versions of these documents will be purged from inventory upon completion of the new printing.

Respectfully,

Erica L. McIntosh  
 Marketing Services  
 TW Metals  
 235 Tubeway Dr  
 Carol Stream, IL 60188

Enclosures

cc: Jack Elrod (w/encl.)  
 Bob Mraz (w/encl.)

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Overview

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### Pipe

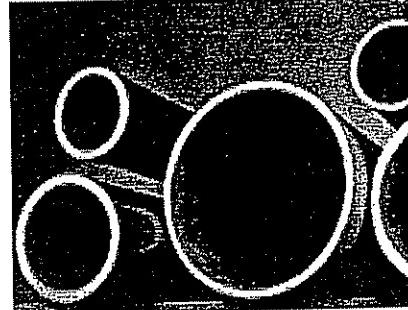
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**TW Metals stocks the pipe inventory you need, including:**

#### **Stainless Steel Pipe**

A complete selection of welded and seamless pipe in a full range of sizes:



Grades 304/L, 316/L, 321

Spec ASTM A312, ASME SA312

Sizes Special fabricated sizes available

Pr

#### **Aluminum Pipe**

An extensive size range of drawn and extruded aluminum pipe products that are suitable for a wide range of applications — including marine, cryogenics, and power generation.

Grades 5000 series, especially 5083 and 5086  
6000 series, especially 6061 and 6063

Spec Latest revision of ASTM specs

#### **Nickel Pipe**

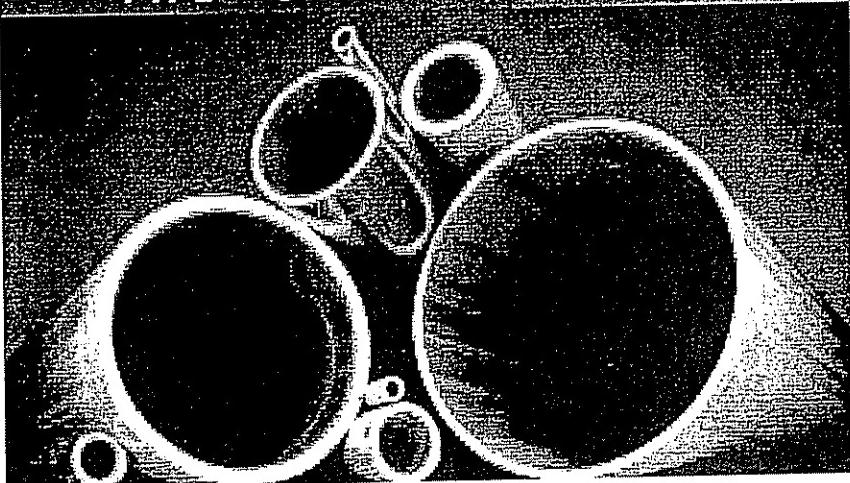
TW Metals is your source for welded and seamless nickel pipe, with decades of experience in serving such industries as corrosion and heat treatment, oil and gas, pulp and paper, and pharmaceuticals.

Grades 200, 400, 600, 601, 625, 800, 800H,  
800HT, C276, Alloy 20

Spec Latest revision of ASTM and ASME  
specs TW Metals also provides  
complementary products such as bar,  
tubing and pipe fittings.

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- Grades: ... 304/L, 316/L, 321
- Specs: .... ASTM A312, ASME SA312
- Sizes: ..... Special fabricated sizes available

#### **Aluminum Pipe**

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- Grades: .... 5000 series, especially 5083 and 5086 6000 series, especially 6061 and 6063
- Specs: ..... Latest revision of ASTM specs

#### **Nickel Pipe**

TW Metals is your source for welded and seamless nickel pipe, with decades of experience in serving such industries as corrosion and heat treatment, oil and gas, pulp and paper, and pharmaceuticals.

- Grades: .... 200, 400, 600, 601, 625, 800, 800H, 800HT, C276, Alloy 20
- Specs: ..... Latest revision of ASTM and ASME specs

*TW Metals also provides complementary products such as bar, tubing and pipe fittings*

And because we maintain a deep inventory at each of our nationwide locations, you're assured of delivery in two days or less.



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So when you want the best in tube, pipe, bar/rod, or extrusions in stainless, aluminum, nickel, alloy, or titanium, think TW Metals. Call us today at 1-800-203-8000.

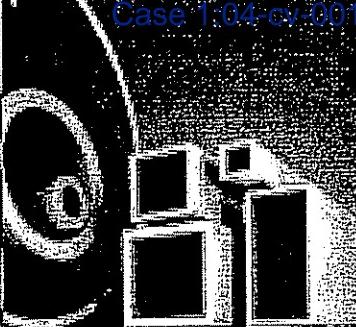
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PIPE - STAINLESS, ALUMINUM, AND NICKEL

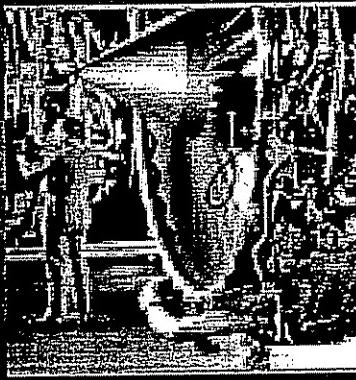
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## PIPE SCHEDULES

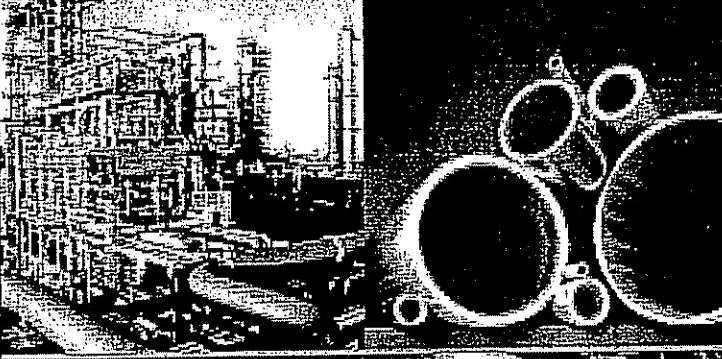
PIPE SIZE	O.D. IN INCHES	PIPE SCHEDULES										DBL. E.H.								
		5s	5	10s	10	20	+	30	40s & E.H.	40	+	60	80s & E.H.	80	100	120	140	160		
1/8	405		.035	.049	.049	.049			.058	.068			.095	.095						
			1.383	1.863	1.863	1.863			2447	2447			3145	.119						
										.0850				.1090						
1/4	540		.049	.065	.065	.065			.088	.088			.119	.119						
			2.570	3.287	3.287	3.287			4248	4248			5351	.6351						
										.1470				.1850						
3/8	675		.049	.065	.065	.065			.091	.091			.126	.126						
			3.276	4.235	4.235	4.235			5676	5676			7388	.7388						
										.1960				.2560						
1/2	840	.085	.065	.065	.065	.065			.109	.109			.147	.147						
		5.383	5.383	6.707	6.719	6.719			8510	8510			1.088	1.088						
			1.680	2.320	2.320	2.320				.2940				.3760						
3/4	1.050	.085	.065	.065	.065	.065			.113	.113			.154	.154						
		6.838	6.838	8.572	8.572	8.572			1.131	1.131			1.474	1.474						
			2.370	2.870	2.870	2.870				3910				.8100						
1	1.315	.065	.055	.055	.055	.055			.133	.133			.179	.179						
		8.678	8.678	1.464	1.464	1.464			1.679	1.679			2.172	2.172						
			3.000	4.860	4.860	4.860				.5610				.7516						
1 1/4	1.560	.065	.055	.055	.055	.055			.140	.140			.191	.191						
		1.107	1.107	1.805	1.805	1.805			2.273	2.273			2.897	2.897						
			3.630	6.258	6.258	6.258				.7860				.037						
1 1/2	1.900	.065	.055	.055	.055	.055			.145	.145			.200	.200						
		1.274	1.274	2.085	2.085	2.085			2.718	2.718			3.631	3.631						
			4.410	7.210	7.210	7.210				.9400				1.256						
2	2.375	.065	.055	.055	.055	.055			.154	.154			.218	.218						
		1.504	1.504	2.638	2.638	2.638			3.653	3.653			5.022	5.022						
			5.550	9.130	9.130	9.130				1.264				1.737						
2 1/2	2.875	.083	.063	.063	.063	.063			.203	.203			.276	.276						
		2.475	2.475	3.531	3.531	3.531			5.793	5.793			7.561	7.561						
			8.660	1.221	1.221	1.221				.004				2.650						
3	3.500	.029	.083	.083	.083	.083			.215	.215			.300	.300						
		3.025	3.025	4.332	4.332	4.332			7.576	7.576			10.25	10.25						
			1.048	1.488	1.488	1.488				.6261				3.547						
3 1/2	4.000	.083	.083	.083	.083	.083			.226	.226			.318	.318						
		3.472	3.472	4.937	4.937	4.937			9.109	9.109			12.51	12.51						
			1.201	1.720	1.720	1.720				.9109	.9109			4.326	4.326					
4	4.500	.083	.083	.083	.083	.083			.237	.237			.337	.337						
		2.915	2.915	5.613	5.613	5.613			10.79	10.79			14.98	14.98						
			1.354	1.942	1.942	1.942				.7333				5.183						
									.247				.355							
4 1/2	5.000								12.54				17.61							
5	5.563	.108	.108	.108	.108	.108			.258	.258			.375	.375						
		6.348	6.348	7.770	7.770	7.770			14.62	14.62			20.78	20.78						
			2.186	2.688	2.688	2.688				.5057				7.188						
6	6.625	.109	.109	.109	.109	.109			.280	.280			.432	.432						
		7.585	7.585	9.289	9.289	9.289			18.97	18.97			28.57	28.57						
			2.624	3.213	3.213	3.213				.6564				9.884						
7	7.625								.301				.500							
									23.54				38.04							
8	8.625	.109	.109	.109	.109	.109			.322	.322			.406	.406						
		9.914	9.914	13.40	13.40	13.40			24.70	24.70			35.64	43.39						
			3.429	4.635	4.635	4.635			8.543	8.543			12.33	15.01						
9	9.625								.342	.342			.500							
									33.91				48.73							
10	10.75	.134	.134	.134	.134	.134			.365	.365			.500	.500						
		15.19	15.19	18.65	18.65	18.65			34.24	34.24			54.74	54.74						
			6.453	9.698	9.698	9.698			11.34	11.34			18.93	22.25						
									.375	.375			.600	.600						
11	11.75								45.56				60.08							
12	12.75	.156	.156	.156	.156	.156			.375	.375			.562	.562						
		22.18	22.18	24.16	24.16	24.16			43.77	43.77			65.42	68.83						
					8.359	11.55	11.55			15.14	15.14			25.31	30.82					
14	14.00	.156	.156	.156	.156	.156			.375	.375			.594	.594						
		23.07	27.73	36.71	45.61	45.61			54.57	54.57			72.09	72.09						
16	16.00	.165	.165	.165	.165	.165			.375	.375			.656	.656						
		27.90	31.75	42.05	52.27	52.27			62.56	62.56			82.77	136.6						
18	18.00	.165	.165	.165	.165	.165			.438	.438			.750	.750						
		31.43	35.75	47.39	58.94	58.94			82.15	82.15			136.2	93.45						
20	20.00	.188	.218	.218	.250	.275			.500	.500			.594	.594						
		39.78	46.05	52.73	78.60	78.60			104.1	104.1			165.4	104.1						
24	24.00	.218	.250	.250	.375	.375			.562	.562			.812	.812						
		55.37	63.41	63.41	98.42	140.7			94.62	94.62			238.4	129.5						
26	26.00								.312	.312			.500							
28	28.00								.625	.625			136.17							
30	30.00	.250	.312	.312	.500	.500			182.73	110.64										
		79.43	98.93	157.53	196.08	118.65							157.53							
32	32.00								.625	.625			.500							
34	34.00								105.59	168.21			168.21							
36	36.00								112.25	178.89			222.78	134.67						
									.312	.312			.625	.625						
									118.92				236.13	142.68						
									.375	.375			.750							
									102.63				189.57							



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Quality.**



**Dependable  
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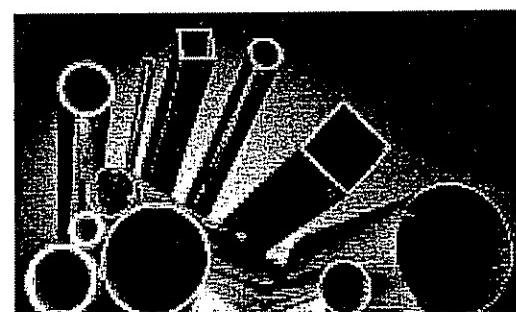
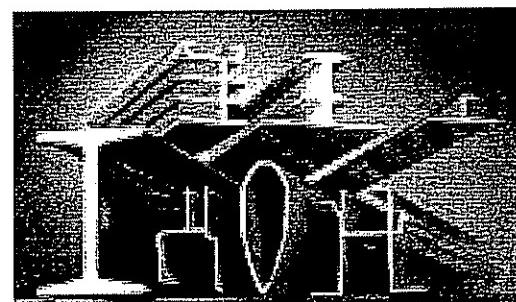
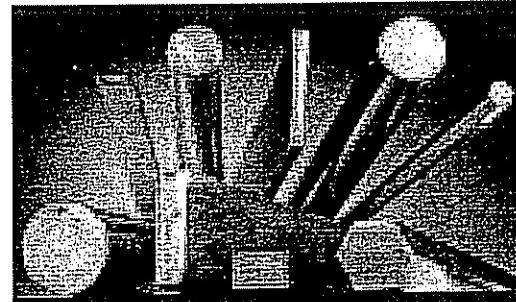
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Precision Sawing	In House Inspection	Tube Assemblies
Automated Deburring	Laser Cutting	Tube Shearing
Customized Packaging	Lathe Tube Cutting	Vibratory Finishing
Fabricated Parts	Polishing	Water Jet Cutting

...And many other services available.

## ISO 9001:2000 Certified Quality.

TW Metals is your assurance of finished products that satisfy your most demanding performance standards. Our in-house certified inspectors perform incoming and outgoing inspection using state-of-the-art equipment. TW Metals insists that our suppliers meet the highest quality standards in their industries, and conducts regular inspections to ensure compliance. We also maintain test certificates to ensure full material traceability, along with a library of all current international standards and customer specifications.

## Quality Products.

TW Metals carefully selects superior quality metals products from leading manufacturers. We also enjoy supply relationships with leading worldwide sources. Regardless of the manufacturer, TW Metals assumes responsibility for supplier qualification, order placement, and delivery schedules, and coordinates manufacturers to ensure on-time delivery.

### TUBING

MATERIALS	GRADES/ALLOYS	SIZE RANGES
Aluminum Alloys	2024, 3003, 5052, 6061, 6063, 7075, Aircraft, Commercial, Construction, Structural, Mechanical, Drawn, Extruded, Ornamental, Rounds, Rectangles, Squares	Outside Diameters ~ 1/8" to 16" Wall Thickness <sup>1</sup> from .020" to 2.000"
Stainless Steel	303, 304, 304L, 316, 316L, 321, 347, 17-4, 15-5, Aircraft, Commercial, Heat Exchanger, Hollow Bar, Hypodermic, Instrumentation, Mechanical, Sanitary, Seamless, Welded and Drawn, As Welded, Ornamental, Round, Rectangular, Square (Mill and Polished Finish)	Outside Diameters ~ .031" to 12" Wall Thickness <sup>1</sup> from .004" to 2.000"
Nickel & High Performance Alloys	200, 400, 600, 601, 625, 800, 800H, B25, C276, 21-6-9, Alloy 20, Aircraft, Commercial, Seamless, Welded	Outside Diameters ~ .031" to 7" Wall Thickness <sup>1</sup> from .007" to 1-1/2"
Titanium	CP, 3AL-2.5V, 15-3-3-3, GR 2, 6AL-4V, Ducting	Outside Diameters ~ 1/4" to 8" Wall Thickness <sup>1</sup> from .016" to .260"
Carbon & Alloy Steel	Low Carbon, 1020, 1026, 4130, 4135, 4140, 4340, 8620, 52100, Aircraft, Mechanical, Hydraulic, ERW, DOM, Seamless, Welded, As Welded, Round, Rectangular, Square, Streamline, Structural Shapes	Outside Diameters ~ .125" to 12" Wall Thickness <sup>1</sup> from .020" to 3.000"

- Standard lengths Aluminum 12' • Standard lengths other than Aluminum 17/24' rls
- Purchased to Applicable industry specifications • Custom dimensional requirements available upon request

### PIPE

MATERIALS	GRADES/ALLOYS	SIZE RANGES
Aluminum Alloys	5083, 5086, 6061, 6063, Construction Grades, Handrail, Drawn, Extruded, Port Hole Die, Seamless, Structural	Pipe Sizes ~ 1/8" NPS to 12" NPS Schedules from: 10 to 80
Stainless Steel	304, 304L, 316, 316L, 2205, 321, 347, 446, Seamless, Welded, As Welded, Brewery Quality	Pipe Sizes ~ 1/8" NPS to 30" NPS Schedules from 5 to XXH
Nickel & High Performance Alloys	200, 400, 600, 601, 625, 800, 800H, B200HT, C276, Alloy 20, Seamless, Welded	Pipe Sizes ~ 1/8" NPS to 8" NPS Schedules from 10 to XXH
Carbon & Alloy Steel	Black, Line, Seamless, Structural, ERW	Pipe Sizes ~ 1/8" NPS to 12" NPS Schedules from: 10 to 80

- Standard lengths Aluminum 24' rls • Standard lengths other than aluminum 17/24' rls
- Purchased to Applicable industry specifications

Additional Products &  
Services provided on a  
customer specific basis.

And through our long-term commitments with producers, we ensure continuity of systems and quality. TW Metals monitors manufacturing mill performance against your requirements, and our own, for delivery security, documentation accuracy, and product quality.

### **ROD, BAR & WIRE**

MATERIALS	GRADES/ALLOYS	SIZE RANGES
Aluminum Alloys	1100, 2011, 2024, 2219, 6061, 6063, 6101, 7075	Rounds – 1/8" to 16" Hex – 1/4" to 2-3/4" Squares – 1/4" to 6" Flats – 1/8" to 5"
Stainless Steel	303, 304, 304L, 309S, 316, 316L, 410, 416, 17-4, 15-5, 13-B, Equal & Unequal Angles	Rounds – 1/8" to 16" Hex – 1/4" to 2-1/2" Squares – 1/4" to 3" Flats – 1/8" to 3" Edge Conditioned
Nickel & High Performance Alloys	200, 330, 400, 600, 601, 625, 718, X750, 800, 800H, 800AT, B25, C276, HX, K500, Alloy 20	Rounds – 3/16" to 11" Edge Conditioned
Titanium	6AL-4V	Rounds – 3/8" to 6-1/4"
Carbon & Alloy Steel	300M, 4130, 4140, 4150, 4340, 6150, 8620, 8740, 9310, 52100	Rounds – 1/8" to 12" Hex – 1/4" to 1-1/8"

- Custom flat bar widths and lengths available upon request • Standard lengths 12' long • Applicable industry specifications

### **SHEET & PLATE**

MATERIALS	GRADES/ALLOYS	SIZE RANGES
Aluminum Alloys	2014, 2024, 2024 Alclad, 6061, 7050, 7075, 7075 Alclad	From .016" thick to 8" thick
Nickel Alloys	625, HX, 718	From .016" thick to .093" thick
Titanium	CP, 5AL-2.5SN, 6AL-4V, 6AL-6V-2SN	Available in standard thickness x width x length dimensions

- Industry standard widths and lengths • PVC Coatings available upon request • Applicable industry specifications

### **EXTRUSIONS**

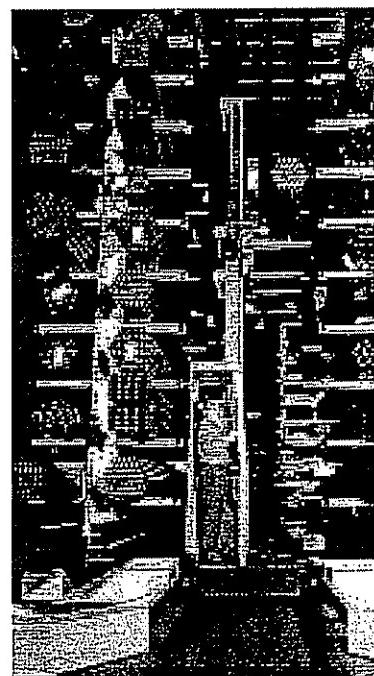
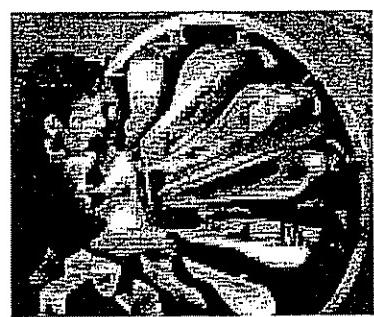
MATERIALS	GRADES/ALLOYS	SIZE RANGES
Aluminum Extrusions	1100, 2014, 2024, 2224, 5052, 5083, 5086, 6061, 6063, 7050, 7075, 7150, 7178	Aircraft Extrusions by Mfg Part Numbers, Angles, Architectural, A.N.D., H-Beams, I-Beams, Channels, Structural, Shapes, Wide Flange, Zee

- Titanium, stainless steel and Alloy steel extrusions available upon request • Applicable Commercial and Aerospace industry specifications

### **SPECIALITY PRODUCTS**

MATERIALS	GRADES/ALLOYS	SIZE RANGES
Fittings	Stainless Steel, Aluminum, Nickel, Titanium	CryoFit™, CryoLive™, Butt Weld & Threaded, Flanges, Heads
Hinge Pin Stock	Aluminum, Stainless Steel, Titanium	Standard Aircraft sizes applicable
Roll Formed Shapes	Aluminum	Aircraft Applications

- Applicable Commercial and Aerospace industry specifications



## Specialists who know your business.

Your TW Metals representative is a professional who is backed by years of training and experience. As a result, they can provide proactive service and advice to help you succeed. We have extensive experience in a wide range of industries, including:

Aerospace	Food/Beverage/Dairy	Oil Refining/
Agricultural	Healthcare	Petrochemical
Equipment	Instrumentation	Original Equipment
Aircraft MRO	Lawn and Garden	Manufacturers
Automotive	Marine	Pharmaceutical
Chemical	Metal Fabricators	Pulp and Paper
Chemical Processing	Motorsports	Recreation/Leisure
Communications	Oil Production/	Steel Making
Equipment	Oil Tool	Utilities

This high level of industry expertise translates into cost-effective solutions that help you solve everyday production challenges.

## e-Commerce Capabilities.

At TW Metals, we have continued to develop our e-Commerce capabilities. Through our electronic online ordering system, our customers are able to order online, access detailed product information and inventory data, place and track orders, and view account history.

We are continuously updating our site through ongoing enhancements and improvements to provide more detailed catalog descriptions and online pricing capabilities.

## Contact TW Metals, today.

For the best in world-class materials, systems, service, and quality, make TW Metals your preferred provider. For more information or a no-obligation consultation, call today or visit our website at [www.twmetals.com](http://www.twmetals.com).

HE 00851

## An Inventory of Superior Products

### Tubing

Materials	Grades/ Alloys	Size Ranges
Aluminum Alloys	2024, 3003, 5052, 6061, 6063, 7075, Seamless. Extruded, Squares, Rectangles, Structural, Ornamentals	Outside Diameters 1/8" to 12" Wall thickness' from .020 to 1.000"
Stainless Steel	303, 304, 304L, 316, 316L, 321, 347, PH grades, Seamless, Welded and Drawn, As welded, instrumentation, Polished, Hypodermic	Outside Diameters .009" to 10" Wall thickness' from .0025 to 2.000"
Nickel Alloys	200, 400, 600, 601, 625, 800H, 825, C276	Outside Diameters .009" to 10" Wall thickness' from .0025 to 2.000"
Titanium Alloy	CP, 3AL - 2.5V, Ducting 4130, 4340, 8620, 52100, Squares, Rectangles, Streamline	Outside Diameters from 1/4" Wall thickness' from .020"  Outside Diameters 3/16" to 10" Wall thickness' from .028" to 1.000"

Standard lengths other than Aluminum 5/7.5mts.

Purchased to Applicable industry specifications.

Custom dimensional requirements available upon request.

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[Coil/Sheet](#) | [Rod, Bar, Wire](#) | [Tubing](#) | [Pipe](#) | [Plate](#) | [Specialty](#)

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An Inventory of Superior Products | Complete Processing Capabilities  
Value-Added Services

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HE 00852

## An Inventory of Superior Products

### Pipe

Materials	Grades/ Alloys	Size Ranges
Stainless Steel	304. 304L. 316, 316L. 321, 347. Seamless. Welded	Pipe Sizes from: 1/8" NPS to 24" NPS Schedules from: 5 to 120
Nickel Alloys	200, 400. 600. 601, 625. 800HT, C276, Alloy 20	Pipe Sizes from: 1/8" NPS to 8" NPS Schedules from: 10 to 80

Standard lengths 5/7.3 Mts.

Purchased to Applicable industry specifications.

Custom dimensional requirements available upon request.

[Coil/Sheet](#) | [Rod, Bar, Wire](#) | [Tubing](#) | [Pipe](#) | [Plate](#) | [Specialty](#)

An Inventory of Superior Products | Complete Processing Capabilities  
Value-Added Services

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## TECHNICAL DATA BULLETIN

**Arcos Alloy 22**  
**AWS Class ERNiCrMo-10**  
**UNS #N06022**

The primary use of Arcos Alloy 22 is for welding nickel-chromium-molybdenum alloys to itself, to steel, to other nickel-base alloys and for cladding steel with nickel-chromium-molybdenum weld metal.

**Typical Chemistry:**

Carbon	.01	Chromium	21.5
Iron	3.1	Manganese	.02
Silicon	.04	Phosphorus	.005
Sulfur	.002	Nickel	Balance
Tungsten	3.5	Molybdenum	13.5
Cobalt	1.8		

**Typical Mechanical Properties:**

115 psi

Elongation 40%

**Recommended Welding Parameters**

Diameter	Process	Amperage	Voltage
.035"	Spray Arc	180-205	26-32
.035"	Short Arc	140-180	18-22
.045"	Spray Arc	225-245	26-32
.045"	Short Arc	150-200	20-26
.063"	Spray Arc	225-350	27-33
.063"	TIG	140-200	10-16
3/32"	TIG	150-220	10-16
1/8"	TIG	160-240	10-16
5/32"	TIG	160-265	10-16
3/16"	TIG	170-320	11-18

**Special Notes:**

- \*good pitting and crevice corrosion resistance
- \*excellent dissimilar welding alloy
- \*clad overlay and spray applications

**Arcos Alloys Corporation**